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STATISTICAL SUMMARY OF 1962 INVENTORY-MUNICIPAL WASTE FACILITIES IN THE UNITED STATES

Andrew C. Glass, et al

Public Health Service
Washington, D.C.

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Statistical Summary of

1962 INVENTORY

Municipal Waste Facilities

in the UNITED STATES

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Basic Data Branch

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Water Supply and Pollution Control
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This summary is based upon data collected in the 1962 Inventory of Municipal Waste Facilities by the various State water pollution control agencies through the regional offices of the Public Health Service. Appreciation is expressed for the efforts of all personnel in the State agencies and those in the regional offices of the Public Health Service who aided in the collection of these data.

To the personnel in the Water and Sewage Facilities Section who faithfully performed their tasks in editing, coding, and preparing the inventory for publication, grateful acknowledgment is also extended.

INTRODUCTION

This report presents a summary and analysis of data on sewage disposal facilities in the United States, which are published in detail in the 1962 Inventory of Municipal Waste Facilities (*1*). The data apply as of January 1, 1962, and this is the fourth such summarization. Earlier summaries (*2*), (*3*), (*4*), reflect inventories of the years 1940, 1945, and 1957. These earlier publications present background discussions of how the inventory activities developed. After the 1957 inventory, (*5*), the decision was made to update the data on a 5-year schedule.

In late 1961, the data at hand (usually the same as was published for the 1957 Inventory) was placed to the left of a separate sheet for each entry. Revised data were recorded in spaces to the right. The report forms were returned through Public Health Service regional offices, where they were reviewed for completeness and aptness, then forwarded to headquarters for processing. The information was again reviewed and edited, then embossed on metal plates. Listing equipment placed the information for each entry on a horizontal line on preprinted pages as shown in figure 1. These pages were then published in nine volumes by photo-offset process (*1*).

I. BASIC DATA

Methods and Definitions

The data summarized herein were collected between September 1961 and May 1962, but are intended to reflect conditions existing as of January 1, 1962, and show averages for the year 1961. Certain information on the report form was coded, and quantifiable data were punched into cards, then read to magnetic tape for table preparation.

A *community* is defined as any grouping of houses where there is a permanent resident population engaged in a normal domestic pattern of living. It is a named place to which a census population can be attached. It may or may not be incorporated. Where a U.S. Census figure was not available, data were taken from the 1961 Rand McNally Atlas. It may or may not have its own treatment-disposal facility; or it may have more than one.

A *facility* is defined as a treatment plant, or in the case of raw discharge, the collection system. There may be more than one facility in a community or one facility may serve several communities. In a tabulation, the population served is associated with the serving facility.

Population Size Groups

Each report was placed in one of the eight groups shown below according to the 1960 census population of the *community* in which the facility was located.

Group	*Population range*
1	Under 500.
2	500–1,000.
3	1,000–5,000.
4	5,000–10,000.
5	10,000–25,000.
6	25,000–50,000.
7	50,000–100,000.
8	100,000 and over.

Facilities located in sanitary districts for which a census could not be determined were grouped according to the population served. Such a report is not counted as a community, but is counted as a facility. For example, Community A in Group 4 has 6,500 persons served by Community

INVENTORY OF MUNICIPAL WASTE FACILITIES

STATE | YEAR | PAGE

COMMUNITY SEWER OR SANITARY DISTRICT INSTITUTION	COUNTY	1960 Population	Estimated Population Served	TYPE SEWER SYSTEM	AVERAGE DAILY FLOW MGD	Design For: Average Daily Flow MGD; P.E. (1000's)	TREATMENT FACILITIES: TREATMENT	LINE NO.
1	2	3	4	5	6	7	8	
								1
								2
								3
								4
~								~
								29
								30

Figure 1.

B in Group 7. Community A is counted as a community in Group 4, but the 6,500 persons served are counted in Group 7, where the serving facility is listed. Conversely, Facility B in Group 3 serves 3,500 persons of Community B, but also 15,000 additional people in 3 other communities. The report is classified in Group 3, the size of the community in which it is located and all 18,500 persons are counted in here. The three other communities are counted as communities in their respective groups, but the population served is not counted. Thus, it is theoretically possible in a table for a count of a community to appear with no associated population served. It is also possible for a population served to appear with no community count, if the serving facility happened to be a sanitary district.

Drainage Basins

Following the Water Pollution Control Act of 1948, the United States was divided into drainage basins according to figure 2. Alaska, Hawaii, and Puerto Rico additionally have arbitrarily been classed as major basins. The data are published in this summary by major basin only, although they have been tabulated by some 250 minor basins within the major divisions. This finer breakdown has been furnished to cooperating agencies and is on file in the Washington office of the Division of Water Supply and Pollution Control.

Summary Data

The basic data in this summary are produced in 10 tables. The population-served figures have not been rounded off, because of inherent

INVENTORY OF MUNICIPAL WASTE FACILITIES

STATE					YEAR		PAGE
LINE NO.	COMMUNITY, SEWER OR SANITARY DISTRICT INSTITUTION	DRAINAGE BASIN Major	DRAINAGE BASIN Sub	WATER-COURSE MILEAGE	DISCHARGE TO	P.E. (BOD) UNTREATED WASTE / DISCHARGED WASTE	Pollution Abatement Needs	REMARKS
	9	10	10a	11	12	13	14	15
1								
2								
3								
4								
≈								
29								
30								

Figure 1—Continued.

difficulties in balancing between tables. However, *no fictitious precision is imputed to these data since they are, at best, only estimates.*

National summaries are given in tables 1, 2, and 3 for sewer systems, sewage treatment, and disposal. Details by States, population size groups, and major drainage basins are given in tables 5 through 9. The data in tables 1, 2, and 3 are a portion of later tables and are brought together for a quick summary of nationwide conditions.

Figure 2.

Tables 2 and 3 are additive, as are the detail tables from which they are taken. If more than one type of settling tank was present in a primary plant, the plant was classified as of the highest type. The general order was: Imhoff tanks, mechanically cleaned tanks, plain hopper-bottom tanks, settling tanks with no details, and septic tanks. Similarly, when more than one secondary process was present, the classification was in this order: extended aeration, activated sludge, high rate trickling filters, standard rate filters, intermittent sand filters, stabilization ponds and application to land.

Data for selected intermediate and secondary treatment processes are given in table 8. These are not additive, since a facility might use more than one. For instance, a trickling filter might be followed by a stabilization pond. In the plant classification, this would be considered as a trickling filter and counted once, but in table 8, concerned with

Table 1. Municipal sewage treatment summary for the United States

	Number	Percent
Number of communities with sewer systems	11,420	.....
Discharging raw sewage only	2,139	18.7
Discharging treated sewage only	9,171	80.3
Discharging both raw and treated sewage	110	1.0
Type sewers—number of communities:		
Separate	9,083	[1] 82.5
Combined	1,305	[1] 11.9
Both	618	[1] 5.6
Not stated	414	.....
1960 census population of sewered communities	123,406,458	.....
Estimated population:		
Connected to sewers	118,371,919	.....
Discharging raw	14,686,941	12.4
Discharging treated	103,684,978	87.6
Number of facilities—total	11,655	100.0
Discharging raw	2,277	19.5
Discharging treated	9,378	80.5
TREATMENT		
Treatment plants—total	9,378	100.0
Minor [2]	37	.4
Primary	2,672	28.5
Intermediate	85	.9
Secondary	6,584	70.2
Estimated population served by		
Minor treatment [2]	2,350,845	2.3
Primary treatment	32,733,831	31.6
Intermediate treatment	7,408,950	7.1
Secondary treatment	61,191,352	59.0

[1] Percent of reported cases, not percent of total communities.
[2] Less than sedimentation.

Table 2. *Primary treatment plants for the United States*

Process	Number of plants	Estimated population served	Percent of—	
			Number of plants	Estimated population served
Septic tanks	575	681,091	21.5	2.1
Imhoff tanks	1,015	2,495,154	38.0	7.6
Mechanically cleaned tanks	956	27,709,229	35.8	84.6
Plain hopper bottom tanks	72	1,475,007	2.7	4.5
Settling tanks—no details stated	39	281,545	1.5	.9
Others and unknown	15	91,805	.5	.3
Total	2,672	32,733,831	100.0	100.0

only the presence of processes, it is considered both places and counted twice.

Table 4 shows the population served by the various population size groupings. This table is especially made to show the extent to which communities dispose their wastes through the facilities of others. Throughout the tabulations, populations served by another facility are counted with the serving facility. Table 4 shows there were nearly 27 million persons so served. For instance, there were 372,720 persons served by facilities in communities of less than 500 census population. In addition. there were 33,737 persons in places of this size group served by facilities of some other place, any size group. It happened that 3,525 were in the same size, under 500. Thus, it can be determined that in places under 500 population there were 402,932 persons connected to sewers, served by their own or other facilities. This type of adjustment was not made on State or basin tables, because a shift could occur only when persons in one State or basin were served by facilities in another State or basin. Hence, with these exceptions, the population served would be the same as the population connected to sewers.

Table 3. *Secondary treatment plants for the United States*

Process	Number of plants	Estimated population served	Percent of—	
			Number of plants	Estimated population served
Activated sludge	800	33,287,343	12.2	54.3
Extended aeration	154	405,998	2.3	.6
Trickling filters:				
Standard rate	2,135	11,532,628	32.4	19.0
High rate	1,371	11,473,643	20.8	18.7
Sand filters	341	510,259	5.2	.8
Land application	267	890,758	4.1	1.5
Stabilization ponds (lagoons)	1,348	2,195,258	20.4	3.6
Others and unknown	168	895,465	2.6	1.5
Total	6,584	61,191,352	100.0	100.0

Table 4. *Population connected to sewers and served by disposal facilities—by population groups*

Census population size group	Population served by size of community shown	Population connected to sewers in size of community shown	Population in community of size shown served by other facilities	Population served contributed to community of size shown
Under 500	372,720	402,932	33,737	3,525
500–1,000	1,217,796	1,270,069	85,983	33,710
1,000–5,000	9,840,904	10,682,029	1,099,851	258,726
5,000–10,000	7,653,310	8,487,130	1,593,114	759,294
10,000–25,000	12,987,183	16,250,129	4,137,963	875,017
25,000–50,000	10,184,862	13,549,038	4,258,867	894,691
50,000–100,000	10,207,350	13,493,594	4,816,699	1,530,455
100,000 and over	65,907,794	54,236,998	10,834,290	22,505,086
Total	118,371,919	118,371,919	26,860,504	26,860,504

Table 5. *Summary of communities having sewer systems and sewage disposal by population groups, States, and drainage basins*

	Number of communities	1960 census population	Estimated population served	Type of sewer system in community								Type of treatment status					
				Separate		Combined		Both		Not stated		Treated		Untreated		Both	
				Number	Population	Number	Population	Number	Population	Number	Population	Number	Population	Number	Population	Number	Population
POPULATION SIZE GROUPS																	
Under 500	1,253	393,071	372,720	1,110	334,126	52	16,959	13	3,530	78	18,105	1,019	304,177	227	64,768	7	3,775
500–999	1,830	1,352,822	1,217,796	1,545	1,013,334	167	117,971	31	21,810	87	64,681	1,409	931,100	416	282,281	5	4,415
1,000–4,999	5,015	11,726,091	9,840,904	4,042	8,014,501	591	1,159,195	220	448,131	162	219,077	3,902	7,814,012	1,074	1,932,234	39	94,658
5,000–9,999	1,409	9,929,587	7,653,310	1,070	5,893,827	175	908,516	130	768,117	34	82,850	1,173	6,323,972	220	1,226,303	16	101,035
10,000–24,999	1,157	17,749,384	12,967,183	856	9,619,776	170	1,870,565	97	1,245,242	34	231,600	1,018	11,146,353	127	1,627,220	12	213,610
25,000–49,999	420	14,560,520	10,184,862	273	6,264,500	73	1,909,950	64	1,893,277	10	117,135	370	8,808,602	39	937,155	11	439,105
50,000–99,999	200	13,761,463	10,207,350	119	6,070,000	48	2,258,960	27	1,783,605	6	94,785	170	8,408,540	24	1,363,425	6	435,385
Over 100,000	136	53,933,520	65,907,794	68	20,098,985	29	17,721,939	36	27,672,315	3	414,555	110	50,400,614	12	3,627,130	14	11,840,050
STATES																	
Alabama	165	1,752,770	1,495,043	162	1,493,218					3	1,825	112	1,130,670	48	189,923	5	174,450
Alaska	21	88,121	61,620	8	3,260			13	58,360			1	10,000	20	51,620		
Arizona	65	971,304	710,649	63	689,734	1	20,000			1	915	60	684,099	5	25,950		600
Arkansas	149	850,612	792,675	129	705,285	2	64,300			18	23,090	125	616,475	23	170,200	1	6,000
California	535	13,647,760	11,458,492	507	9,359,536	12	2,057,910			16	41,046	519	11,335,032	12	44,385	4	79,075
Colorado	170	1,267,698	1,421,106	164	1,309,431	1	107,000			5	4,675	144	1,397,736	26	23,370		
Connecticut	71	2,039,766	1,491,656	46	574,837	16	490,919	8	421,900	1	4,000	62	1,438,816	9	52,840		
Delaware	23	173,771	267,241	13	25,158	1	2,700	6	238,520	3	863	20	262,978	3	4,263		
District of Columbia	1	763,956	1,323,470					1	1,323,470			1	1,323,470				
Florida	291	2,699,283	2,170,514	283	2,111,239	2	21,500			6	37,775	253	1,876,189	16	46,065	22	248,260
Georgia	229	2,153,909	2,268,492	216	1,083,157	3	914,515	2	268,920	8	1,900	156	1,584,220	61	405,917	12	278,355
Hawaii	19	433,561	362,166	19	362,166							9	58,871	8	28,850	2	274,445
Idaho	90	328,847	302,999	78	244,894	10	48,905	2	9,200			63	261,039	27	41,960		
Illinois	553	7,894,148	7,908,321	360	1,227,256	154	4,833,140	29	1,835,280	10	12,645	519	7,672,861	34	235,460		
Indiana	296	2,844,340	2,867,845	85	364,915	202	2,445,065	3	36,040	6	21,825	167	2,542,930	127	254,585	2	70,330
Iowa	423	1,745,481	1,576,800	384	983,090	18	184,760	10	402,350	11	6,600	357	1,300,960	65	274,310	1	1,530
Kansas	324	1,438,548	1,468,250	308	1,180,007	1	107,000	3	176,400	12	4,845	310	1,312,440	14	155,810		
Kentucky	164	1,242,044	1,263,145	124	563,080	27	658,620	5	41,445	8		115	1,158,010	47	101,370	2	3,765
Louisiana	125	1,782,968	2,100,673	124	2,095,553					1	5,120	95	824,045	26	1,170,935	4	105,693
Maine	102	642,554	479,453	31	68,720	39	198,650	31	210,608	1	1,475	12	40,875	86	412,058	4	26,520
Maryland	117	1,680,808	1,352,909	97	1,327,134	8	16,800	3	2,500	9	6,475	98	1,317,744	19	35,165		
Massachusetts	179	4,508,054	4,389,580	117	649,165	37	931,760	14	2,828,605	11	10,050	120	3,542,235	57	843,695	2	3,650
Michigan	289	5,532,673	6,170,560	121	570,100	95	4,252,685	67	1,292,275	6	55,500	265	6,106,285	23	61,175	1	3,100
Minnesota	431	2,280,282	2,062,595	400	857,145	29	1,185,710	1	19,690	1	50	371	1,997,715	60	64,880		
Mississippi	139	888,144	779,456	135	755,056			1	18,600	3	5,800	89	346,676	45	393,380	5	39,400
Missouri	381	2,886,491	2,643,725	333	1,065,225	6	44,945	20	1,411,960	22	121,595	291	891,490	87	1,264,735	3	487,500
Montana	115	401,570	385,220	104	299,680	4	19,600	7	65,940			106	361,920	9	23,300		
Nebraska	296	935,087	802,230	274	517,470	13	26,790	5	245,150	4	12,820	221	416,020	73	144,555	2	241,655
Nevada	36	213,692	314,030	32	233,430	4	80,600					32	307,390	4	6,640		

New Hampshire	73	468,914	283,460	15	45,660	28	91,350	27	144,200	3	2,250	15	56,510	56	181,850	2	45,100	
New Jersey	288	5,002,289	4,504,015	238	2,314,640	15	366,375	3	1,311,185	32	511,815	281	4,400,220	6	16,110	1	87,685	
New Mexico	66	615,305	599,821	66	599,821							65	598,721	1	1,100			
New York	494	12,838,123	13,443,148	346	2,709,148	53	519,525	49	10,192,945	46	21,530	356	3,449,034	127	503,059	11	9,491,0	
North Carolina	290	1,879,379	1,751,365	286	1,742,940	1	1,020			3	7,405	194	1,288,580	92	435,200	4	27,5	
North Dakota	185	353,179	321,175	127	118,930	48	196,855			10	5,390	170	270,755	15	50,420			
Ohio	493	6,701,076	6,776,295	263	1,856,930	123	1,735,680	56	3,110,420	51	73,265	493	6,414,855	87	347,710	3	13,730	
Oklahoma	267	1,603,137	1,452,524	263	1,438,724					4	13,800	259	1,434,474	8	9,050			
Oregon	152	967,349	927,080	104	270,110	37	610,280	6	43,100	5	3,590	132	802,480	18	40,600	2	384,000	
Pennsylvania	869	8,671,896	9,559,417	578	2,687,262	158	707,915	113	6,144,115	20	20,125	554	8,384,667	312	1,164,250	3	10,500	
Puerto Rico	70	990,484	121,634	70	121,634							60	94,954	10	26,680			
Rhode Island	27	651,052	561,975	23	174,385	1		2	386,470	1	1,120	20	557,890	7	4,085			
South Carolina	154	933,634	927,114	154	927,114							120	599,892	31	228,642	3	98,580	
South Dakota	181	376,775	378,257	154	3,3,162	20	15,925	7	19,170			159	332,202	22	46,055			
Tennessee	133	1,598,530	1,478,443	124	1,122,268	5	195,125	1	142,100	3	18,950	110	899,447	23	578,996			
Texas	666	7,442,832	6,602,147	662	6,486,047	2	55,000	1	58,100	2	3,040	659	6,565,152	7	36,995			
Utah	89	610,301	695,635	89	695,635							69	465,045	20	230,590			
Vermont	47	201,152	186,157	5	8,390	7	8,55[illegible]	34	165,812	1	3,400	10	46,702	36	102,255	1	37,200	
Virginia	201	1,975,592	1,866,241	172	1,481,817	1	180,000	4	181,050	24	23,374	150	1,782,239	49	82,787	2	1,215	
Washington	209	1,684,603	1,628,330	125	373,650	42	825,505	13	302,030	29	127,145	173	845,225	33	39,875	3	743,230	
West Virginia	174	806,945	726,181	99	168,460	47	425,471	19	87,970	9	44,280	44	244,170	128	391,086	2	90,925	
Wisconsin	421	2,729,523	2,668,315	335	712,268	33	1,315,600	52	640,147	1	300	414	2,565,025	6	6,390	1	96,900	
Wyoming	72	226,145	222,275	68	221,155					4	1,120	61	212,940	11	9,335			
MAJOR DRAINAGE BASINS																		
Northeast	831	12,064,684	11,008,760	467	2,787,541	173	2,047,289	158	6,126,715	33	47,215	453	7,527,288	360	2,024,247	18	1,457,225	
North Atlantic	1,148	24,015,560	25,084,392	882	7,996,664	111	1,163,195	67	15,393,785	88	530,748	924	15,996,686	209	846,146	5	8,241,560	
Southeast	1,172	9,841,966	8,979,455	1,145	7,718,445	5	936,015	3	272,125	19	52,870	882	6,684,068	243	1,472,297	47	823,090	
Tennessee River	167	1,157,209	1,036,582	146	844,453	3	14,870	2	144,945	16	32,314	102	805,652	62	196,990	3	33,940	
Ohio River	1,399	11,197,319	11,357,121	815	3,628,995	378	4,041,556	132	3,567,985	74	118,585	899	9,755,710	491	1,428,326	9	173,085	
Lake Erie	208	3,473,424	3,489,480	91	614,585	76	1,056,090	22	1,756,185	19	32,620	158	3,381,580	48	98,895	2	9,005	
Upper Mississippi	1,687	13,546,326	13,069,198	1,338	3,321,704	237	6,588,100	74	3,099,664	38	59,730	1,480	11,554,718	207	1,509,480		5,000	
Western Great Lakes	499	8,225,134	8,812,313	258	972,560	141	5,957,810	92	1,822,173	8	59,770	459	8,624,098	38	88,215	2	100,000	
Missouri River	1,277	5,261,143	4,965,207	1,148	3,493,542	66	241,850	30	1,127,060	33	102,755	1,091	3,521,957	180	717,565	6	725,685	
Southwest-Lower Mississippi	1,028	7,015,740	7,137,803	992	6,906,223	5	167,480	1	18,600	30	45,500	911	4,954,110	110	2,051,600	7	122,093	
Colorado River	161	1,267,807	1,112,735	157	1,082,920	1	24,500			3	5,315	130	1,052,340	31	59,795		600	
Western Gulf	627	7,398,243	6,575,667	623	6,459,527	1	55,000	1	58,100	2	3,040	617	6,536,412	10	39,255			
Pacific Northwest	463	3,059,351	2,914,689	314	891,834	92	1,501,790	23	390,330	34	130,735	374	1,643,024	84	144,435	5	1,127,230	
California	495	13,480,393	11,288,230	473	9,198,054	12	2,057,910			10	32,266	482	11,188,795	11	36,385	2	63,050	
Great Basin	148	889,994	994,867	137	904,942	4	80,600			7	9,325	129	749,107	17	229,735	2	16,025	
Alaska	21	88,121	61,620	8	3,260			13	58,360			1	10,000	20	51,620			
Hawaii	19	433,561	362,166	19	362,166							9	58,871	8	28,850	2	274,445	
Puerto Rico	70	990,484	121,634	70	121,634							60	94,954	10	26,680			
Total	11,420	123,406,458	118,371,919	9,083	57,309,049	1,305	25,964,055	618	33,836,027	414	1,262,788	9,171	94,139,370	2,139	11,060,516	110	13,172,033	

Table 5A. *Summary of facilities having sewer systems and sewage disposal by population groups, States, and drainage basins*

	Total		Separate		Combined		Both		Not stated		Treated		Untreated	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS														
Under 500	1,271	372,720	1,145	334,126	51	16,959	12	3,530	63	18,105	1,041	307,047	230	65,673
500–999	1,827	1,217,796	1,556	1,013,334	161	117,971	31	21,810	79	64,681	1,408	934,615	419	283,181
1,000–4,999	5,049	9,840,904	4,145	8,014,501	567	1,159,195	212	448,131	125	219,077	3,930	7,862,950	1,119	1,977,954
5,000–9,999	1,357	7,653,310	1,061	5,893,827	149	908,516	125	768,117	22	82,850	1,113	6,362,202	244	1,291,108
10,000–24,999	1,097	12,987,183	858	9,619,776	131	1,870,565	81	1,245,242	27	251,600	955	11,235,863	142	1,751,320
25,000–49,999	413	10,184,862	286	6,264,500	57	1,909,950	64	1,893,277	6	117,135	363	9,090,052	50	1,094,810
50,000–99,999	206	10,207,350	137	6,070,000	36	2,258,960	30	1,783,605	3	94,785	172	8,657,240	34	1,550,110
Over 100,000	435	65,907,794	274	20,098,985	57	17,721,939	92	27,672,315	12	414,555	396	59,235,009	39	6,672,785
STATES														
Alabama	216	1,495,043	214	1,493,218	.....	.....	.....	.....	2	1,825	144	1,231,420	72	263,623
Alaska	21	61,620	8	3,260	.....	.....	13	58,360	.....	.....	1	10,000	20	51,620
Arizona	74	710,649	72	689,734	1	20,000	.....	.....	1	915	69	684,699	5	25,950
Arkansas	161	792,675	141	705,285	2	64,300	.....	.....	18	23,090	137	618,475	24	174,200
California	506	11,458,492	477	9,359,536	17	2,057,910	.....	.....	12	41,046	484	11,399,057	22	59,435
Colorado	176	1,421,106	170	1,309,431	3	107,000	.....	.....	3	4,675	149	1,397,736	27	23,370
Connecticut	91	1,491,656	66	574,837	15	490,919	9	421,900	1	4,000	82	1,438,816	9	52,840
Delaware	16	267,241	9	25,158	1	2,700	5	238,520	1	863	13	262,978	3	4,263
District of Columbia	1	1,323,470	.....	.....	.....	.....	1	1,323,470	.....	.....	1	1,323,470	.....	.....
Florida	346	2,170,514	333	2,111,239	2	21,500	.....	.....	11	37,775	328	2,106,749	18	63,765
Georgia	276	2,268,492	262	1,083,157	6	914,515	4	268,920	4	1,900	199	1,722,370	77	546,122
Hawaii	27	362,166	27	362,166	.....	.....	.....	.....	.....	.....	17	60,091	10	302,075
Idaho	91	302,999	79	244,894	10	48,905	2	9,200	.....	.....	64	261,039	27	41,960
Illinois	472	7,908,321	329	1,227,256	107	4,833,140	26	1,835,280	10	12,645	444	7,672,861	28	235,460
Indiana	321	2,867,845	103	364,915	206	2,445,065	3	36,040	9	21,825	190	2,598,375	131	269,470
Iowa	438	1,576,800	400	983,090	18	184,760	10	402,350	10	6,600	372	1,302,430	66	274,370
Kansas	335	1,468,250	325	1,180,005	2	107,000	3	176,400	5	4,845	322	1,312,440	13	155,810
Kentucky	161	1,263,145	134	563,080	20	658,620	7	41,445	.....	.....	112	1,159,600	49	103,545
Louisiana	161	2,100,673	158	2,095,553	.....	.....	.....	.....	3	5,120	127	827,058	34	1,273,615
Maine	109	479,453	37	68,720	39	198,650	32	210,608	1	1,475	17	43,995	92	435,458
Maryland	72	1,352,909	54	1,327,134	7	16,800	3	2,500	8	6,475	53	1,317,744	19	35,165
Massachusetts	144	4,389,580	81	619,165	40	931,760	10	2,828,605	13	10,050	85	3,544,635	59	844,945
Michigan	236	6,170,560	110	570,100	66	4,252,685	58	1,292,275	2	55,500	213	6,109,385	23	61,175
Minnesota	404	2,062,595	373	857,145	27	1,185,710	3	19,690	1	50	344	1,997,715	60	64,880
Mississippi	168	779,456	164	755,056	.....	.....	1	18,600	3	5,800	118	353,976	50	425,480
Missouri	466	2,643,725	411	1,065,225	6	44,945	24	1,411,960	25	121,595	366	912,990	100	1,730,735
Montana	114	385,220	103	299,680	4	19,600	7	65,940	.....	.....	106	361,920	8	23,300
Nebraska	300	802,230	275	517,470	13	26,790	6	245,150	6	12,820	225	477,675	75	324,555

Nevada	37	314,030	33	233,430	4	80,600	.....	.....	.....	.....	33	307,390	4	6,640
New Hampshire	78	283,460	19	45,660	29	91,350	27	144,200	3	2,250	19	59,610	59	223,850
New Jersey	210	4,504,015	169	2,314,640	9	366,375	5	1,311,185	27	511,815	203	4,450,220	7	53,795
New Mexico	76	599,821	76	599,821	.....	.....	.....	.....	.....	.....	75	598,721	1	1,100
New York	548	13,443,148	389	2,709,148	53	519,525	87	10,192,945	19	21,530	407	11,420,209	141	2,022,939
North Carolina	359	1,751,365	355	1,742,940	1	1,020	.....	.....	3	7,405	255	1,299,980	104	451,385
North Dakota	185	321,175	127	118,930	48	196,855	.....	.....	10	5,390	170	270,755	15	50,420
Ohio	441	6,776,295	241	1,856,930	117	1,735,680	59	3,110,420	24	73,265	351	6,416,805	90	359,490
Oklahoma	284	1,452,524	279	1,438,724	.....	.....	.....	.....	5	13,800	276	1,443,474	8	9,050
Oregon	165	927,080	116	270,110	37	610,280	6	46,100	.....	3,590	146	866,480	19	60,600
Pennsylvania	682	9,559,417	439	2,687,262	137	707,915	95	6,144,115	11	20,125	384	8,389,337	298	1,170,080
Puerto Rico	69	121,634	69	121,634	.....	.....	.....	.....	.....	.....	59	94,954	10	26,680
Rhode Island	22	561,975	18	174,385	.....	.....	3	386,470	1	1,120	15	557,890	7	4,085
South Carolina	221	927,114	221	927,114	.....	.....	.....	.....	.....	.....	175	616,442	46	310,672
South Dakota	181	378,257	154	343,162	20	15,925	7	19,170	.....	.....	159	332,202	22	46,055
Tennessee	135	1,478,443	126	1,122,268	5	195,125	2	142,100	2	18,950	112	899,447	23	578,996
Texas	832	6,602,147	826	6,486,007	1	55,000	3	58,100	2	3,040	825	6,565,152	7	36,995
Utah	75	695,635	75	695,635	.....	.....	.....	.....	.....	.....	55	465,045	20	230,590
Vermont	52	186,157	8	8,390	7	8,555	36	165,812	1	3,400	14	74,902	38	111,255
Virginia	231	1,866,241	202	1,481,817	1	180,000	5	181,050	23	23,374	178	1,783,249	53	82,992
Washington	230	1,628,330	133	373,650	46	825,505	15	302,030	36	127,145	193	1,094,455	37	533,875
West Virginia	176	726,181	98	168,460	48	425,471	19	87,970	11	44,280	46	294,195	130	431,986
Wisconsin	392	2,668,315	306	712,268	34	1,315,600	51	640,147	1	300	386	2,661,425	6	6,890
Wyoming	71	222,275	68	221,155	.....	.....	.....	.....	3	1,120	60	212,940	11	9,335
MAJOR DRAINAGE BASINS														
Northeast	889	11,008,760	507	2,787,541	173	2,047,289	173	6,126,715	36	47,215	507	8,707,998	382	2,300,762
North Atlantic	952	25,084,392	708	7,996,664	102	1,160,195	92	19,393,785	50	530,748	741	22,877,761	211	2,206,631
Southeast	1,465	8,979,455	1,432	7,718,445	8	936,015	6	272,125	19	45,870	1,157	7,156,678	308	1,822,777
Tennessee River	181	1,036,582	160	844,453	3	14,870	3	144,945	15	32,314	111	837,452	70	199,130
Ohio River	1,293	11,357,121	782	3,628,995	352	4,041,556	117	3,567,985	42	118,585	803	9,865,510	490	1,491,911
Lake Erie	178	3,489,480	69	614,585	74	1,086,090	20	1,756,185	11	32,620	128	3,381,880	50	107,600
Upper Mississippi	1,607	13,069,198	1,365	3,321,704	190	6,588,100	71	3,099,664	41	59,730	1,397	11,558,718	210	1,510,480
Western Great Lakes	439	8,812,313	234	972,560	114	5,957,810	85	1,822,173	6	59,770	400	8,723,598	39	88,715
Missouri River	1,341	4,965,207	1,214	3,493,542	68	241,850	34	1,127,060	25	102,755	1,153	3,602,582	188	1,362,625
Southwest-Lower Mississippi	1,133	7,137,803	1,095	6,906,223	5	167,480	1	18,600	32	45,500	1,011	4,960,223	122	2,177,580
Colorado River	174	1,112,735	169	1,082,920	2	24,500	.....	.....	3	5,315	143	1,052,940	31	59,795
Western Gulf	791	6,575,667	785	6,459,527	1	55,000	3	58,100	2	3,040	781	6,536,412	10	39,255
Pacific Northwest	494	2,914,689	331	891,834	96	1,501,790	25	390,330	42	130,735	406	2,256,254	88	658,435
California	464	11,268,230	436	9,198,054	17	2,057,910	.....	.....	11	32,266	445	11,249,745	19	38,485
Great Basin	137	994,867	131	904,942	4	80,600	.....	.....	2	9,325	118	752,182	19	242,685
Alaska	21	61,620	8	3,260	.....	.....	13	58,360	.....	.....	1	10,000	20	51,620
Hawaii	27	362,166	27	362,166	.....	.....	.....	.....	.....	.....	17	60,091	10	302,075
Puerto Rico	69	121,634	69	121,634	.....	.....	.....	.....	.....	.....	59	94,954	10	26,680
Total	11,655	118,371,919	9,462	57,309,049	1,209	25,964,055	647	33,836,027	337	1,262,788	9,378	103,684,978	2,277	14,686,941

Table 5A. *Summary of facilities having sewer systems and sewage disposal by population groups, States and drainage basins*—Continued

	Treated		Untreated		Total		Minor		Primary		Intermediate		Secondary	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
Population Size Groups														
Under 500	1,041	307,047	230	65,673	1,041	307,047	1	250	295	86,296	.....	.....	745	220,501
500–999	1,408	934,615	419	283,181	1,408	934,615	5	3,750	431	282,474	.....	.....	972	648,391
1,000–4,999	3,930	7,862,950	1,119	1,977,954	3,930	7,862,950	11	30,440	1,217	2,179,870	16	38,480	2,686	5,614,160
5,000–9,999	1,113	6,362,202	244	1,291,108	1,113	6,362,202	3	13,365	265	1,403,351	12	76,260	833	4,869,226
10,000–24,999	955	11,235,863	142	1,751,320	955	11,235,863	7	155,930	214	2,854,352	24	335,640	710	7,889,941
25,000–49,999	363	9,090,052	50	1,094,810	363	9,090,052	1	40,000	111	3,077,984	10	411,570	241	5,560,498
50,000–99,999	172	8,657,240	34	1,550,110	172	8,657,240	1	96,000	46	2,352,435	9	599,745	116	5,609,060
Over 100,000	396	59,235,009	39	6,672,785	396	59,235,009	8	2,011,110	93	20,497,069	14	5,947,255	281	30,779,575
States														
Alabama	144	1,231,420	72	263,623	144	1,231,420	.....	.....	69	711,560	.....	.....	75	519,860
Alaska	1	10,000	20	51,620	1	10,000	.....	.....	1	10,000	.....	.....	.....	.....
Arizona	69	684,699	5	25,950	69	684,699	.....	.....	17	35,274	.....	.....	52	649,425
Arkansas	137	618,475	24	174,200	137	618,475	.....	.....	73	173,155	.....	.....	64	445,320
California	484	11,399,057	22	59,435	484	11,399,057	1	4,000	102	7,769,699	4	384,880	377	3,240,478
Colorado	149	1,397,736	27	23,370	149	1,397,736	.....	.....	33	52,205	1	550,000	115	795,531
Connecticut	82	1,438,816	9	52,840	82	1,438,816	2	8,000	47	1,091,093	2	113,400	31	226,523
Delaware	13	262,978	3	4,263	13	262,978	.....	.....	11	259,022	.....	.....	2	3,956
District of Columbia	1	1,323,470	.....	.....	1	1,323,470	.....	.....	.....	.....	.....	.....	1	1,323,470
Florida	328	2,106,749	18	63,765	328	2,106,749	3	68,000	81	836,155	2	39,760	242	1,162,834
Georgia	199	1,722,370	77	546,122	199	1,722,370	.....	.....	112	346,015	1	584,155	86	792,200
Hawaii	17	60,091	10	302,075	17	60,091	.....	.....	8	26,320	.....	.....	9	33,771
Idaho	64	261,039	27	41,960	64	261,039	1	450	37	143,040	.....	.....	26	117,549
Illinois	444	7,672,861	28	235,460	444	7,672,861	.....	.....	72	475,850	2	26,060	370	7,170,951
Indiana	190	2,598,375	131	269,470	190	2,598,375	.....	.....	40	452,870	1	5,800	149	2,139,705
Iowa	372	1,302,430	66	274,370	372	1,302,430	.....	.....	32	221,405	1	4,000	339	1,077,025
Kansas	322	1,312,440	13	155,810	322	1,312,440	.....	.....	38	143,300	.....	.....	284	1,169,140
Kentucky	112	1,159,600	49	103,545	112	1,159,600	.....	.....	30	630,970	3	151,265	79	377,365
Louisiana	127	827,058	34	1,273,615	127	827,058	.....	.....	11	212,895	.....	.....	116	614,163
Maine	17	43,995	92	435,458	17	43,995	.....	.....	14	28,795	.....	.....	3	15,200
Maryland	53	1,317,744	19	35,165	53	1,317,744	2	4,650	30	114,359	.....	.....	21	1,198,735
Massachusetts	85	3,544,635	59	844,945	85	3,544,635	10	1,752,215	22	1,249,235	1	430	52	542,755
Michigan	213	6,109,385	23	61,175	213	6,109,385	2	6,030	109	4,835,900	3	87,200	99	1,180,255
Minnesota	344	1,997,715	60	64,880	344	1,997,715	.....	.....	84	273,685	1	1,041,700	259	682,330
Mississippi	118	353,976	50	425,480	118	353,976	.....	.....	35	40,450	.....	.....	83	313,526
Missouri	366	912,990	100	1,730,735	366	912,990	.....	.....	24	98,170	.....	.....	342	814,820
Montana	106	361,920	8	23,300	106	361,920	.....	.....	32	241,400	2	11,800	72	108,720

Nebraska	225	477,675	75	324,555	225	477,675	.....	.....	43	95,065	1	1,100	181	381,510
Nevada	33	307,390	4	6,640	33	307,390	.....	.....	7	8,990	.....	.....	26	298,400
New Hampshire	19	59,610	59	223,850	19	59,610	.....	.....	9	48,050	.....	.....	10	11,560
New Jersey	203	4,450,220	7	53,795	203	4,450,220	.....	.....	60	2,602,610	6	479,000	137	1,368,610
New Mexico	75	598,721	1	1,100	75	598,721	.....	.....	5	5,196	.....	.....	70	593,525
New York	407	11,420,209	141	2,022,939	407	11,420,209	6	298,680	247	3,158,624	6	92,610	148	7,870,295
North Carolina	255	1,299,980	104	451,385	255	1,299,980	.....	.....	128	165,245	.....	.....	127	1,134,735
North Dakota	170	270,755	15	50,420	170	270,755	.....	.....	33	54,740	.....	.....	137	216,015
Ohio	351	6,416,805	90	359,490	351	6,416,805	.....	.....	102	895,110	27	1,148,015	222	4,373,680
Oklahoma	276	1,443,474	8	9,050	276	1,443,474	.....	.....	36	204,685	1	1,200	239	1,237,589
Oregon	146	866,480	19	60,600	146	866,480	.....	.....	51	596,050	.....	.....	95	270,430
Pennsylvania	384	8,389,337	298	1,170,080	384	8,389,337	1	4,920	114	957,890	6	2,419,465	263	5,007,062
Puerto Rico	59	94,954	10	26,680	59	94,954	.....	.....	34	74,880	1	235	24	19,839
Rhode Island	15	557,890	7	4,085	15	557,890	.....	.....	7	187,790	.....	.....	8	370,100
South Carolina	175	616,442	46	310,672	175	616,442	5	10,040	105	192,825	1	170	64	413,407
South Dakota	159	332,202	22	46,055	159	332,202	.....	.....	36	27,245	.....	.....	123	304,957
Tennessee	112	899,447	23	578,996	112	899,447	.....	.....	42	312,085	.....	.....	70	587,362
Texas	825	6,565,152	7	36,995	825	6,565,152	.....	.....	116	189,851	.....	.....	709	6,375,301
Utah	55	465,045	20	230,590	55	465,045	.....	.....	19	20,170	.....	.....	36	444,875
Vermont	14	74,902	38	111,255	14	74,902	.....	.....	13	66,402	.....	.....	1	8,500
Virginia	178	1,783,249	53	82,992	178	1,783,249	2	185,980	69	978,016	.....	.....	107	619,253
Washington	193	1,094,455	37	533,875	193	1,094,455	1	7,000	86	687,825	2	10,600	104	389,030
West Virginia	46	294,195	130	431,986	46	294,195	.....	.....	32	201,935	.....	.....	14	92,260
Wisconsin	386	2,661,425	6	6,890	386	2,661,425	1	880	107	483,615	8	239,705	270	1,937,225
Wyoming	60	212,940	11	9,335	60	212,940	.....	.....	7	46,115	2	16,400	51	150,425
MAJOR DRAINAGE BASINS														
Northeast	507	8,707,998	382	2,300,762	507	8,707,998	14	1,870,465	291	4,829,840	6	172,830	193	1,834,363
North Atlantic	741	22,877,761	211	2,206,631	741	22,877,761	8	379,060	254	5,192,264	12	2,849,000	467	14,457,437
Southeast	1,157	7,156,678	308	1,822,777	1,157	7,156,678	8	78,040	502	2,186,252	4	624,085	643	4,268,301
Tennessee River	111	837,452	70	199,130	111	837,452	.....	.....	54	408,370	.....	.....	57	429,082
Ohio River	803	9,865,510	490	1,491,911	803	9,865,510	1	4,920	258	2,249,980	26	1,211,255	518	6,399,355
Lake Erie	128	3,381,880	50	107,600	128	3,381,880	.....	.....	31	583,595	8	176,900	89	2,621,385
Upper Mississippi	1,397	11,558,718	210	1,510,480	1,397	11,558,718	1	800	243	1,065,162	6	1,122,210	1,147	9,370,466
Western Great Lakes	400	8,723,598	39	88,715	400	8,723,598	2	6,030	166	5,317,828	9	276,455	223	3,123,285
Missouri River	1,153	3,602,582	188	1,362,625	1,153	3,602,582	.....	.....	202	594,260	5	574,400	946	2,433,922
Southwest-Lower Mississippi	1,011	4,960,223	122	2,177,580	1,011	4,960,223	.....	.....	201	695,220	1	1,200	809	4,263,803
Colorado River	143	1,052,940	31	59,795	143	1,052,940	.....	.....	41	60,334	.....	.....	102	992,605
Western Gulf	781	6,536,412	10	39,255	781	6,536,412	.....	.....	86	160,462	.....	.....	695	6,375,950
Pacific Northwest	406	2,256,254	88	658,435	406	2,256,254	2	7,450	176	1,482,180	2	10,600	226	756,024
California	445	11,249,745	19	38,485	445	11,249,745	1	4,000	96	7,756,734	4	384,880	344	3,104,131
Great Basin	118	752,182	19	242,685	118	752,182	.....	.....	25	40,150	1	4,900	92	707,132
Alaska	1	10,000	20	51,620	1	10,000	.....	.....	1	10,000	.....	.....	.....	.....
Hawaii	17	60,091	10	302,075	17	60,091	.....	.....	8	26,320	.....	.....	9	33,771
Puerto Rico	59	94,954	10	26,680	59	94,954	.....	.....	34	74,880	1	235	24	19,839
Total	9,378	103,684,978	2,277	14,686,941	9,378	103,684,978	37	12,350,845	2,672	32,733,831	85	7,408,950	6,584	61,191,352

Table 6. *Summary of primary treatment plants by population groups, States and drainage basins*

	Total		Septic tanks		Imhoff tanks		Mechanically cleaned tanks		Plain hopper bottom tanks		Tanks with no details in listing		Others and unknown	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
Population Size Groups														
Under 500	295	86,296	119	29,948	145	44,988	20	8,030	7	2,400	4	930	.....	.....
500–999	431	282,474	130	76,565	214	141,641	61	43,663	18	12,745	5	5,875	3	1,985
1,000–4,999	1,217	2,179,870	268	322,998	546	859,400	355	905,607	26	44,345	15	33,700	7	13,820
5,000–9,999	265	1,403,351	30	70,500	53	211,520	169	1,030,721	7	47,885	5	37,725	1	5,000
10,000–24,999	214	2,854,352	13	64,900	26	255,700	159	2,369,620	8	75,032	5	53,100	3	36,000
25,000–49,999	111	3,077,984	7	102,715	11	169,060	87	2,599,754	1	22,000	4	149,455	1	35,000
50,000–99,999	46	2,352,435	6	11,945	4	196,635	34	2,083,095	1	60,000	1	760	.....	.....
Over 100,000	93	20,497,069	2	1,520	16	616,210	71	18,668,739	4	1,210,600	.....	.....	.....	.....
States														
Alabama	69	711,560	26	17,880	26	23,680	17	670,000	.....	.....	.....	.....	.....	.....
Alaska	1	10,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	10,000
Arizona	17	35,274	5	6,900	4	10,649	5	16,900	2	645	.....	.....	1	180
Arkansas	73	173,155	14	40,705	22	33,900	25	84,600	12	13,950	.....	.....	.....	.....
California	102	7,769,699	23	17,075	17	32,889	60	7,717,235	.....	.....	.....	.....	2	2,500
Colorado	33	52,205	10	6,750	11	9,655	11	32,800	1	3,000	.....	.....	.....	.....
Connecticut	47	1,091,093	11	20,475	1	1,500	32	1,065,448	3	3,670	.....	.....	.....	.....
Delaware	11	259,022	1	1,028	3	7,617	7	250,377	.....	.....	.....	.....	.....	.....
Florida	81	836,155	19	22,170	12	4,215	46	795,195	1	700	2	875	1	13,000
Georgia	112	346,015	29	27,500	54	62,190	28	254,825	1	1,500	.....	.....	.....	.....
Hawaii	8	26,320	8	26,320	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Idaho	37	143,040	17	11,400	4	3,375	16	128,265	.....	.....	.....	.....	.....	.....
Illinois	72	475,850	7	12,645	27	63,305	33	393,280	4	5,985	.....	.....	1	635
Indiana	40	452,870	3	5,460	7	14,695	29	429,015	.....	.....	1	3,700	.....	.....
Iowa	32	221,405	17	9,325	10	4,580	5	207,500	.....	.....	.....	.....	.....	.....
Kansas	38	143,300	2	3,600	23	29,620	13	110,080	.....	.....	.....	.....	.....	.....
Kentucky	30	630,970	9	20,345	9	43,000	11	565,755	.....	.....	1	1,870	.....	.....
Louisiana	11	212,895	5	4,250	4	14,160	2	194,485	.....	.....	.....	.....	.....	.....
Maine	14	28,795	5	3,395	3	5,900	9	10,700	2	8,800	.....	.....	.....	.....
Maryland	30	114,359	4	1,585	18	18,474	6	79,800	2	14,500	.....	.....	.....	.....
Massachusetts	22	1,249,235	3	2,550	2	1,250	17	1,245,435	.....	.....	.....	.....	.....	.....
Michigan	109	4,835,900	15	17,590	13	29,140	80	4,777,170	.....	.....	1	12,000	.....	.....
Minnesota	84	273,685	2	2,530	56	41,000	22	229,290	4	865	.....	.....	.....	.....
Mississippi	35	40,450	25	23,250	9	13,600	1	3,600	.....	.....	.....	.....	.....	.....
Missouri	24	98,170	12	6,985	8	10,185	4	81,000	.....	.....	.....	.....	.....	.....
Montana	32	241,400	14	8,625	8	5,375	7	176,400	.....	.....	.....	.....	3	51,000
Nebraska	43	95,065	12	29,660	16	7,305	14	57,520	1	580	.....	.....	.....	.....

Nevada	7	8,990	4	2,700	1	2,000	2	4,290						
New Hampshire	9	48,050	1	200	4	18,850	4	29,000						
New Jersey	60	2,602,610	14	103,475	8	49,510	14	1,043,675	4	1,168,650	19	235,160	1	2,140
New Mexico	5	5,196	2	950	3	4,246								
New York	247	3,158,624	49	79,330	87	709,410	93	2,205,814	11	143,545	5	11,525	2	9,000
North Carolina	128	165,245	22	13,705	87	91,840	14	56,150	4	2,950			1	600
North Dakota	33	54,740	11	9,520	21	15,220	1	30,000						
Ohio	102	895,110	7	4,880	56	398,115	38	490,115					1	2,000
Oklahoma	36	204,685	13	7,495	19	15,590	3	180,000	1	1,600				
Oregon	51	596,050	10	4,100	7	4,540	32	585,810	2	1,600				
Pennsylvania	114	957,890	8	7,670	52	294,765	48	631,515	4	19,140	2	4,800		
Puerto Rico	34	74,880	20	10,555	11	5,040	3	59,285						
Rhode Island	7	187,790	2	1,480			5	186,310						
South Carolina	105	192,825	41	32,535	51	57,775	13	102,515						
South Dakota	36	27,245			34	20,345	2	6,900						
Tennessee	42	312,085			17	28,885	17	270,185	1	1,600	7	11,415		
Texas	116	189,851	15	17,500	100	162,351	1	10,000						
Utah	19	20,170	13	9,030	4	5,260	2	5,880						
Vermont	13	66,402	2	600			5	14,510	6	51,292				
Virginia	69	978,016	8	7,363	27	30,898	33	930,170	1	9,585				
Washington	86	687,825	19	10,395	23	24,325	43	651,755	1	1,350				
West Virginia	32	201,935	7	5,110	16	32,825	5	124,500	4	19,500				
Wisconsin	107	483,615	6	1,675	20	12,105	80	469,635			1	200		
Wyoming	7	46,115	3	225			3	44,540					1	750
Major Drainage Basins														
Northeast	294	4,829,840	58	83,780	77	616,660	132	4,003,213	20	102,307	5	14,880	2	9,000
North Atlantic	254	5,192,264	41	138,943	81	253,760	98	3,245,141	12	1,315,675	21	236,605	1	2,140
Southeast	502	2,186,252	139	117,753	234	241,009	119	1,807,865	6	5,150	2	875	2	13,600
Tennessee River	54	408,370	11	14,965	19	37,620	20	347,585	1	1,600	3	6,600		
Ohio River	258	2,249,980	30	37,950	115	439,570	104	1,746,775	5	20,700	3	2,985	1	2,000
Lake Erie	31	583,595	3	820	18	330,700	10	252,075						
Upper Mississippi	243	1,065,162	30	24,665	93	90,150	112	943,087	7	6,625			1	635
Western Great Lakes	166	5,317,828	20	19,110	30	64,250	112	5,218,343	1	225	3	15,900		
Missouri River	202	594,260	49	55,355	108	78,075	42	456,500	2	3,580			1	750
Southwest-Lower Mississippi	201	695,220	55	73,620	94	114,165	37	488,185	13	15,500	2	3,700		
Colorado River	41	60,334	18	12,135	10	17,904	10	29,470	2	645			1	180
Western Gulf	86	160,462	15	14,100	69	134,862	2	11,500						
Pacific Northwest	176	1,482,180	46	26,120	34	32,740	90	1,369,370	3	2,950			3	51,000
California	96	7,756,734	20	16,080	15	23,119	59	7,715,035					2	2,500
Great Basin	25	40,150	12	8,820	7	15,530	6	15,800						
Alaska	1	10,000											1	10,000
Hawaii	8	26,320	2	26,320										
Puerto Rico	34	74,880	20	10,555	11	5,040	3	59,285						
Total	2,672	32,733,831	575	681,091	1,015	2,495,154	956	27,709,229	72	1,475,007	39	281,545	15	91,805

Table 7. *Summary of secondary treatment plants by population groups, States, and drainage basins*

	Total		Activated sludge		Extended aeration		Trickling filter standard rate		Trickling filter high rate		Intermittent sand filter		Application to land		Stabilization ponds		Others and unknown	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS																		
Under 500	745	220,501	46	15,680	37	8,615	124	40,595	62	22,210	80	18,881	51	14,519	334	96,391	11	3,610
500–999	972	648,391	62	44,710	14	7,325	348	243,258	123	82,781	86	49,910	43	29,915	279	179,242	17	11,250
1,000–4,999	2,686	5,614,160	236	569,223	45	83,440	983	2,125,752	551	1,311,601	106	138,090	117	249,464	593	1,006,895	55	129,695
5,000–9,999	833	4,869,226	111	789,090	13	57,555	309	1,822,073	236	1,457,235	40	80,283	30	167,575	66	329,560	28	165,855
10,000–24,999	710	7,889,941	123	1,707,855	13	58,530	235	2,585,300	229	2,657,626	20	133,250	15	140,875	49	334,535	26	271,970
25,000–49,999	241	5,560,498	68	1,906,005	9	93,613	53	1,158,180	77	1,927,350	4	41,055	5	81,410	12	124,900	13	227,985
50,000–99,999	116	5,609,060	45	2,247,665	1	59,000	30	1,458,290	26	1,526,670	1	45,000	4	157,000	9	115,435	....	....
Over 100,000	281	30,779,575	109	26,007,115	22	37,920	53	2,099,190	67	2,488,170	4	3,790	2	50,000	6	8,300	18	85,100
STATES																		
Alabama	75	519,860	6	237,610	5	4,200	18	71,650	31	171,200	....	....	1	800	14	34,400	....	....
Arizona	52	649,425	2	424,700	....	....	4	41,000	4	66,000	2	16,300	17	45,575	22	55,810	1	40
Arkansas	64	445,320	2	96,000	....	....	6	93,620	32	213,410	2	700	....	....	21	40,590	1	1,000
California	377	3,240,478	42	1,042,120	6	14,805	71	664,276	63	739,930	....	....	130	525,254	61	231,718	4	22,375
Colorado	115	795,531	....	....	5	57,070	11	25,330	34	569,910	1	690	9	6,500	49	71,251	6	64,780
Connecticut	31	226,323	7	57,950	....	....	4	33,760	7	78,680	13	55,933	....	....	....	....	....	....
Delaware	2	3,956	....	....	....	....	1	2,191	1	1,765	....	....	....	....	....	....	....	....
District of Columbia	1	1,323,470	1	1,323,470	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Florida	242	1,162,834	38	454,105	4	1,850	6	26,100	161	620,109	16	9,915	3	11,795	14	38,960	....	....
Georgia	86	792,200	1	120,000	....	....	61	539,620	14	105,800	2	1,125	....	....	6	10,900	2	14,755
Hawaii	9	33,771	1	8,690	4	11,383	....	....	3	13,398	....	....	....	....	1	300	....	....
Idaho	26	117,549	3	33,400	....	....	2	15,300	11	59,400	....	....	3	624	7	8,825	....	....
Illinois	370	7,170,951	91	5,754,141	1	2,000	201	1,019,185	22	336,830	15	13,380	....	....	40	45,415	....	....
Indiana	149	2,139,705	71	1,720,160	1	1,400	39	236,535	30	170,220	1	100	....	....	6	8,290	1	3,000
Iowa	339	1,077,025	1	22,000	....	....	208	917,025	36	80,085	59	36,590	2	600	33	20,725	....	....
Kansas	284	1,169,140	8	166,500	....	....	203	851,005	6	107,150	12	9,610	....	....	55	34,875	....	....
Kentucky	79	377,365	6	22,340	10	24,750	36	218,500	27	111,775	....	....	....	....	....	....	....	....
Louisiana	116	614,163	13	225,725	12	6,900	28	123,105	35	202,215	1	275	....	....	26	54,943	1	1,000
Maine	3	15,200	....	....	....	....	....	....	....	....	1	600	1	200	1	14,400	....	....
Maryland	21	1,198,755	7	1,137,105	....	....	5	20,560	7	39,970	1	700	1	400	....	....	....	....
Massachusetts	52	542,755	6	26,550	....	....	13	203,045	12	270,230	21	42,930	....	....	....	....	....	....
Michigan	99	1,180,255	30	891,580	2	3,400	32	90,485	23	154,895	8	32,615	1	1,130	2	4,150	1	2,000
Minnesota	259	682,330	14	45,340	3	700	74	155,570	124	409,915	....	....	2	975	42	69,830	....	....
Mississippi	83	313,526	3	67,000	....	....	6	34,660	16	122,950	3	1,550	....	....	55	87,366	....	....
Missouri	342	814,020	21	210,770	17	4,615	118	357,100	11	39,230	26	10,735	....	....	149	192,370	....	....
Montana	72	108,720	4	4,900	....	....	1	2,300	....	....	1	210	7	4,680	59	96,630	....	....
Nebraska	181	381,510	35	103,295	5	1,830	56	146,760	11	81,100	6	4,050	....	....	65	43,165	3	1,310

Nevada	26	298,400	....	....	....	....	2	1,770	6	262,500	....	....	7	8,650	11	25,480	....	....
New Hampshire	10	11,560	....	....	....	....	2	2,200	1	1,000	2	1,000	1	100	3	5,260	1	2,000
New Jersey	137	1,368,610	15	267,515	....	....	44	345,660	16	320,270	21	121,905	1	37,685	11	51,885	29	223,660
New Mexico	70	593,525	....	....	....	....	15	28,735	35	546,580	....	....	7	8,230	13	5,200	....	....
New York	148	7,870,295	22	7,084,500	9	76,065	63	449,020	5	51,800	33	45,825	....	....	....	....	16	163,085
North Carolina	127	1,134,735	15	363,650	....	....	32	201,860	53	545,390	24	19,635	....	....	3	4,200	....	....
North Dakota	137	216,015	....	....	....	....	6	81,650	....	....	....	....	....	4,585	125	119,780	....	....
Ohio	222	4,373,680	86	3,307,685	17	25,825	79	770,165	24	245,945	15	22,235	....	....	1	1,825	....	....
Oklahoma	239	1,237,589	16	273,260	....	....	134	522,075	21	378,994	....	....	....	....	68	63,260	....	....
Oregon	95	270,430	8	10,510	....	....	27	81,180	40	155,250	2	500	6	5,750	12	17,240	....	....
Pennsylvania	263	5,007,062	65	3,808,632	31	132,290	92	576,685	53	457,930	16	27,455	3	2,450	1	420	2	1,200
Puerto Rico	24	19,839	7	3,310	....	....	....	....	17	16,529	....	....	....	....	....	....	....	....
Rhode Island	8	370,100	4	335,080	....	....	3	34,620	....	....	....	....	....	....	1	400	....	....
South Carolina	64	413,407	4	6,796	1	1,715	27	188,981	22	185,930	3	1,930	....	....	7	28,055	....	....
South Dakota	123	304,957	2	66,150	....	....	34	121,680	5	47,300	3	2,840	....	....	79	66,987	....	....
Tennessee	70	587,362	12	263,950	....	....	39	220,002	12	90,210	1	1,000	1	550	2	960	3	10,690
Texas	709	6,375,301	48	1,802,300	21	35,200	153	1,338,511	181	2,354,569	20	23,020	32	181,050	197	453,155	57	187,505
Utah	36	444,875	2	21,395	....	....	4	165,800	18	170,620	....	....	3	6,605	1	1,800	8	78,655
Vermont	1	8,500	....	....	....	....	....	....	1	8,500	....	....	....	....	....	....	....	....
Virginia	107	619,253	13	108,709	....	....	39	134,296	23	312,784	6	1,521	....	....	9	12,208	17	49,735
Washington	104	389,030	8	80,530	....	....	8	44,300	47	159,395	1	1,000	13	18,510	23	76,045	4	9,250
West Virginia	14	92,260	....	....	....	....	7	40,900	2	15,135	....	....	3	1,225	....	....	2	35,000
Wisconsin	270	1,937,225	60	1,287,890	....	....	116	230,316	68	380,854	1	2,000	4	5,635	13	6,405	8	24,125
Wyoming	51	150,425	....	....	....	....	5	63,540	....	....	2	385	3	11,200	40	75,000	1	300
Major Drainage Basins																		
Northeast	193	1,834,863	24	1 546,130	6	73,765	67	664,690	22	359,445	60	130,473	2	300	5	20,060	7	40,000
North Atlantic	467	14,457,437	94	1,689,561	14	63,585	155	987,293	82	1,073,354	44	155,366	5	40,535	18	64,033	55	383,710
Southeast	643	4,268,301	65	1,277,551	10	7,765	151	1,026,070	288	1,725,169	47	33,155	4	12,595	76	168,241	2	14,755
Tennessee River	57	429,082	9	116,085	....	....	32	245,517	13	61,140	1	1,000	1	500	....	....	1	4,790
Ohio River	518	6,399,355	132	4,184,650	43	108,865	194	1,356,880	98	636,410	25	33,040	3	1,225	15	18,415	8	59,870
Lake Erie	89	2,621,385	46	2,437,475	4	3,355	26	113,505	8	61,165	4	4,060	....	....	1	1,825	....	....
Upper Mississippi	1,147	9,370,466	139	6,079,401	18	5,235	515	2,109,951	210	890,539	61	35,340	8	7,625	192	225,825	4	16,550
Western Great Lakes	223	3,123,285	75	2,411,135	2	3,400	71	212,275	56	445,865	9	34,615	1	1,130	4	5,290	5	9,575
Missouri River	946	2,433,922	56	396,515	11	52,330	298	871,675	52	499,815	49	31,115	18	21,850	452	494,232	10	66,390
Southwest-Lower Mississippi	809	4,263,803	39	846,685	14	25,810	355	1,700,885	129	1,309,984	17	13,735	9	13,620	241	320,689	5	32,395
Colorado River	102	992,606	2	424,700	1	500	7	61,800	24	354,465	3	16,990	23	53,085	41	81,026	1	40
Western Gulf	695	6,375,950	47	1,675,000	21	35,200	151	1,211,261	192	2,676,810	18	19,870	32	177,350	180	423,349	54	157,110
Pacific Northwest	226	756,024	20	126,940	....	....	35	123,480	95	360,495	3	1,500	21	24,584	48	109,775	4	9,250
California	344	3,104,131	40	1,033,620	4	13,505	68	633,879	63	729,565	....	....	112	464,719	53	206,468	4	22,375
Great Basin	92	707,132	4	29,895	2	1,300	10	213,467	19	256,780	....	....	28	71,590	21	55,730	8	78,655
Alaska	....	....	....	....	....	....	....	....	3	13,398	....	....	....	....	1	300	....	....
Hawaii	9	33,771	1	8,690	4	11,383	....	....	17	16,529	....	....	....	....	....	....	....	....
Puerto Rico	24	19,839	7	3,310	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	6,584	61,191,352	800	33,287,343	154	405,998	2,135	11,532,628	1,371	11,473,643	341	510,259	267	890,758	1,348	2,195,258	168	895,465

Table 8. *Summary of selected intermediate and secondary treatment processes by population groups, States, and drainage basins*

	Chemical treatment		Activated sludge		Extended aeration		Application to land		Standard rate filter		High rate filter		Intermittent sand filter		Stabilization ponds	
	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served	Number	Population served
POPULATION SIZE GROUPS																
Under 500			41	14,380	37	8,615	61	17,014	110	38,005	63	22,340	83	19,486	345	102,738
500–999	1	600	59	42,260	14	7,325	56	38,845	347	241,273	124	83,551	86	49,385	310	207,097
1,000–4,999	1	3,200	231	560,403	47	86,840	164	384,108	1,019	2,245,099	556	1,325,351	101	137,265	739	1,357,960
5,000–9,999	4	27,470	116	825,730	13	57,555	53	346,300	324	2,009,300	243	1,523,945	44	94,963	113	622,375
10,000–24,999	11	189,195	115	1,618,795	13	58,530	36	463,180	260	2,883,984	236	2,841,271	26	162,900	92	816,965
25,000–49,999	5	249,180	65	1,749,205	9	93,613	15	400,610	54	1,361,225	80	2,037,350	4	21,905	23	380,356
50,000–99,999	3	261,600	42	2,088,665	1	59,000	8	485,000	34	1,827,000	27	1,541,670	3	91,300	13	360,155
Over 100,000	1	584,155	105	24,245,055	22	37,920	8	549,200	55	3,983,475	69	2,961,970	4	2,740	20	450,190
STATES																
Alabama			6	237,610	5	4,200	1	800	17	74,500	32	221,200			14	34,400
Alaska																
Arizona	1	7,000	2	424,700			22	296,875	4	41,000	5	230,700	2	16,300	36	169,830
Arkansas	1	41,500	2	96,000					6	93,620	32	213,410	2	700	27	69,790
California	1	10,000	35	891,520	7	15,195	199	1,547,878	56	722,231	67	803,100			165	984,569
Colorado					5	57,070	11	127,400	9	21,730	35	609,910			46	70,808
Connecticut	1	82,000	7	57,950					4	33,760	7	78,680	14	62,933		
Delaware									1	2,191	1	1,765				
District of Columbia			1	1,323,470												
Florida	1	39,060	34	447,315	3	1,460	7	24,955	6	35,170	164	665,739	16	9,915	33	79,890
Georgia	1	584,155	2	129,000					62	564,620	14	200,800	2	1,125	6	10,900
Hawaii			1	8,690	4	11,383	1	40			3	13,398			3	13,946
Idaho			3	33,400			3	624	5	39,300	11	59,400			5	5,625
Illinois			89	5,714,941	1	2,000			208	1,187,855	23	345,830	15	13,380	53	99,500
Indiana	3	101,450	67	1,578,540	1	1,400			50	277,965	33	184,150	3	1,600	6	8,290
Iowa			1	22,000			2	600	220	941,360	36	80,085	59	36,590	34	22,725
Kansas			7	166,100			2	3,600	200	846,015	8	124,050	12	9,610	83	97,775
Kentucky			6	22,340	10	24,750			36	218,500	27	111,775				
Louisiana			13	225,725	12	6,900			24	105,965	35	202,215	1	275	27	59,743
Maine							1	200	8	1,137,080	7	39,970	1	700		
Maryland			7	1,137,105			1	400	14	220,185	12	270,230	21	42,930	1	12,750
Massachusetts			6	26,550			2	5,760	31	304,875	24	164,095	10	53,515	1	1,350
Michigan	3	87,200	28	761,080	2	3,400	1	1,130	71	176,900	124	409,915			44	70,990
Minnesota	1	25,120	14	45,340	3	700	2	975	4	23,760	16	122,950	3	1,550	55	87,366
Mississippi			3	67,000					118	350,000	10	38,030	28	10,875	153	207,470
Missouri			22	211,870	18	6,615			1	2,300			1	210	54	93,090
Montana			4	4,900			7	4,680	46	131,625	11	81,100	6	4,050	66	43,545

Nebraska			35	103,295	5	1,830	6	3,180	3	9,770	5	254,500			13	30,980
Nevada							11	119,920	3	3,200	1	1,000	2	1,000	3	5,260
New Hampshire							1	100	27	260,010	16	320,270	21	100,820	9	49,885
New Jersey	1	20,500	15	267,545			1	37,685	50	575,315	35	546,580			21	28,760
New Mexico							21	186,410	46	418,290	5	51,800	31	39,785	2	330
New York	2	18,200	19	7,042,030	9	76,065	1	150	23	243,365	54	560,390	24	19,635	3	4,200
North Carolina			15	363,650					6	81,650					125	129,780
North Dakota							6	4,585	100	842,770	25	253,675	15	22,235	1	1,825
Ohio	3	31,415	88	3,321,175	18	27,225			134	739,869	22	390,994			87	123,325
Oklahoma			16	273,260					24	79,820	39	143,250	3	560	13	31,640
Oregon			8	10,510			8	15,250	103	737,655	55	587,930	35	113,075	2	6,620
Pennsylvania	4	200,600	58	2,193,282	31	132,290	5	3,850			17	16,529				
Puerto Rico			7	3,310											1	400
Rhode Island			4	335,080					2	33,500					7	28,055
South Carolina			4	6,796	1	1,715			24	185,781	22	185,930	3	1,930	81	81,747
South Dakota			2	66,150					35	135,680	5	47,300	3	2,840	2	960
Tennessee			11	262,700			1	550	26	89,747	14	104,835	1	1,000	279	1,323,105
Texas			48	1,797,900	21	35,200	40	241,405	158	1,463,411	180	2,488,660	4	4,700	1	1,800
Utah			2	21,395			4	8,345	4	165,800	19	189,015				
Vermont											1	8,500				
Virginia			14	74,009					37	120,496	23	312,784	6	1,521	24	34,192
Washington			8	80,530			16	21,110	5	31,400	48	161,895	3	1,600	23	75,995
West Virginia							3	1,225	7	40,900	2	15,135				
Wisconsin	3	67,200	60	1,288,730			10	12,100	180	714,885	73	423,979	1	2,000	15	9,945
Wyoming							5	12,475	5	63,540			2	385	30	70,280
MAJOR DRAINAGE BASINS																
Northeast	2	85,200	23	554,760	6	73,765	5	6,210	61	672,790	22	359,445	61	137,473	7	32,980
North Atlantic	5	151,100	87	11,553,111	14	63,585	7	41,935	136	2,095,963	84	1,203,354	53	201,961	33	90,377
Southeast	2	623,215	62	1,205,061	9	7,375	8	25,755	137	1,092,395	293	1,933,799	47	33,155	95	209,171
Tennessee River			10	156,085			1	550	26	141,762	15	75,765	1	1,000		
Ohio River	6	202,410	130	2,614,740	44	110,265	3	1,225	221	1,513,475	101	650,340	35	46,440	15	18,415
Lake Erie	1	5,455	46	2,437,475	4	3,355			32	173,305	9	68,895	4	4,060	1	1,825
Upper Mississippi	1	25,120	138	5,951,991	18	5,235	14	14,090	576	2,568,975	216	942,664	62	35,440	210	287,360
Western Great Lakes	6	154,400	69	2,280,215	2	3,400	1	1,130	90	599,700	57	455,065	11	55,515	3	2,490
Missouri River			56	397,215	12	54,330	27	27,205	284	856,395	52	538,615	50	31,155	448	523,952
Southwest-Lower Mississippi	1	41,500	39	846,685	14	25,810	15	160,620	350	1,906,269	132	1,338,884	15	10,585	302	514,559
Colorado River	1	7,000	2	424,700		500	32	419,245	13	119,000	24	511,165	2	16,300	56	200,953
Western Gulf			47	1,670,600	21	35,200	51	389,865	182	1,810,811	191	2,810,910	4	4,700	258	1,265,999
Pacific Northwest			20	126,940			26	36,684	32	133,220	96	362,995	6	2,160	45	109,760
California	1	10,000	34	889,020	5	13,895	177	1,466,698	54	698,834	66	780,735			145	856,139
Great Basin			5	23,895	2	1,300	33	93,005	9	206,467	20	274,890			34	168,910
Alaska			1	8,690	4	11,383					3	13,398			3	13,946
Hawaii			7	3,310				40			17	16,529				
Puerto Rico																
Total	26	1,315,400	774	31,144,493	156	409,398	401	2,684,257	1,203	14,589,361	1,398	12,337,448	351	579,944	1,655	4,297,836

Table 9. *Summary of chlorination, grease and grit removal, and sludge processing by population groups, States, and drainage basins*

	Plants with chlorination		Plants with grease removal		Plants with grit removal		Number of plants with—								
	Number	Population served	Number	Population served	Number	Population served	Septic tanks	Imhoff tanks	Stage digestion	Separate digestion	Sludge beds	Lagoons	Mechanical dewatering	Miscellaneous	None or no organized method
POPULATION SIZE GROUPS															
Under 500	195	59,998	.....	.....	35	12,656	208	346	1	90	392	8	.....	35	622
500–999	313	221,310	1	800	110	80,297	217	625	12	262	902	30	1	36	466
1,000–4,999	1,252	2,971,146	17	54,915	871	2,163,967	343	1,433	119	1,253	2,796	89	44	170	979
5,000–9,999	550	3,309,682	19	148,660	473	3,105,555	59	198	120	546	872	28	52	100	163
10,000–24,999	534	7,054,344	26	390,450	509	7,119,523	32	122	177	487	701	41	104	89	139
25,000–49,999	228	5,696,998	17	495,040	232	6,745,241	12	29	92	188	234	31	73	72	50
50,000–99,999	115	5,876,100	11	682,185	117	6,962,540	7	13	48	83	94	17	44	37	28
Over 100,000	263	29,730,410	22	9,200,950	198	53,398,989	4	91	61	168	222	30	65	83	75
STATES															
Alabama	39	518,360	.....	.....	30	897,200	28	33	10	54	92	.....	1	76	51
Alaska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....
Arizona	5	430,940	.....	.....	11	536,200	8	13	5	16	28	.....	.....	2	40
Arkansas	15	180,520	.....	.....	16	232,000	18	32	6	61	102	.....	2	.....	33
California	172	6,488,457	13	681,585	69	6,063,635	55	92	35	157	300	17	11	55	153
Colorado	22	885,155	.....	.....	42	1,143,535	18	26	12	27	84	1	.....	4	64
Connecticut	55	1,012,918	.....	.....	50	1,379,698	19	5	3	29	39	1	26	9	15
Delaware	11	34,478	.....	.....	3	232,025	1	4	1	6	12	.....	1	.....	.....
District of Columbia	1	1,323,470	1	1,323,470	1	1,323,470	.....	.....	.....	1	.....	.....	1	1	.....
Florida	276	1,974,124	.....	.....	110	1,305,243	33	56	10	185	209	1	8	56	91
Georgia	33	1,208,255	5	22,400	71	1,356,155	33	66	6	74	155	.....	2	5	43
Hawaii	12	51,376	.....	.....	1	6,750	7	2	1	2	6	.....	.....	1	10
Idaho	34	237,990	.....	.....	25	195,190	20	5	7	20	30	1	.....	12	29
Illinois	62	603,475	6	3,700,210	151	6,962,171	7	176	59	164	326	61	24	19	68
Indiana	95	1,806,030	3	51,870	112	2,274,305	5	41	10	94	121	29	15	18	34
Iowa	10	128,100	9	449,100	80	965,270	62	145	12	116	295	20	4	7	60
Kansas	.....	.....	.....	.....	33	791,520	2	173	66	58	259	7	2	5	55
Kentucky	60	367,515	1	9,640	41	522,425	9	41	7	49	87	.....	3	2	22
Louisiana	82	744,510	.....	.....	29	520,100	5	40	4	26	70	4	.....	2	51
Maine	10	25,800	.....	.....	4	16,200	7	3	1	2	8	.....	.....	.....	9
Maryland	34	160,060	2	41,400	9	1,229,600	5	19	5	15	36	.....	5	1	12
Massachusetts	37	1,154,655	3	134,800	33	1,716,235	10	16	14	20	49	.....	5	3	31
Michigan	181	5,892,460	1	90,000	102	5,563,285	25	20	36	108	151	4	27	22	36
Minnesota	216	1,833,315	7	192,660	57	1,566,800	2	114	28	114	262	6	9	48	62
Mississippi	13	178,410	.....	.....	5	128,000	25	20	1	15	35	.....	.....	1	83
Missouri	5	38,550	2	13,000	37	385,465	36	66	11	65	131	2	18	17	214
Montana	10	132,000	.....	.....	9	174,200	20	8	6	6	23	2	1	.....	80
Nebraska	1	1,300	1	5,550	12	162,100	14	67	4	46	118	.....	10	33	86

Nevada	6	262,500	.....	.....	8	210,600	12	3	7	5	14	3	.....	.....	18
New Hampshire	12	51,250	.....	.....	6	39,700	4	9	.....	3	10	.....	1	.....	8
New Jersey	168	2,632,180	.....	.....	38	3,091,415	24	40	5	86	124	.....	21	6	56
New Mexico	3	14,000	1	25,000	21	468,150	12	23	11	17	64	.....	.....	.....	11
New York	262	5,475,904	4	724,235	204	10,714,225	68	127	10	138	276	6	14	20	102
North Carolina	65	911,510	2	67,000	116	1,056,870	35	130	7	68	205	.....	6	1	44
North Dakota	.....	.....	.....	.....	5	62,160	13	31	1	1	23	.....	1	1	146
Ohio	116	3,700,560	43	3,000,210	146	5,497,835	10	111	25	104	274	11	52	23	31
Oklahoma	12	534,100	.....	.....	58	934,466	18	100	9	96	203	2	3	.....	73
Oregon	101	436,200	.....	.....	48	728,710	17	20	11	88	92	.....	4	9	43
Pennsylvania	329	4,866,407	2	67,000	110	6,968,885	23	129	28	127	261	3	51	39	78
Puerto Rico	1	58,660	.....	.....	15	67,940	20	18	5	.....	36	1	.....	5	22
Rhode Island	10	509,890	2	90,720	9	500,890	3	.....	1	5	5	1	5	6	4
South Carolina	17	124,815	2	59,775	47	413,325	43	65	4	41	113	.....	1	.....	61
South Dakota	8	71,740	1	12,500	10	183,450	.....	67	5	12	74	11	1	.....	80
Tennessee	75	661,837	1	170,875	18	568,675	2	27	1	54	91	.....	9	2	12
Texas	252	2,812,925	.....	.....	278	5,164,147	23	522	45	239	674	67	6	7	77
Utah	32	438,170	1	40,000	30	433,550	14	7	12	14	33	.....	1	2	21
Vermont	12	74,197	.....	.....	10	67,697	2	.....	6	6	9	1	2	10	2
Virginia	151	1,748,040	.....	.....	73	1,621,129	13	54	11	68	126	7	6	6	42
Washington	152	853,050	.....	.....	70	782,515	29	29	34	73	106	.....	8	15	70
West Virginia	33	260,805	.....	.....	19	196,535	10	21	1	11	31	.....	3	23	11
Wisconsin	138	981,680	.....	.....	57	2,057,272	8	34	29	258	331	11	12	45	29
Wyoming	4	27,345	.....	.....	6	109,850	5	7	2	3	10	.....	.....	1	49
MAJOR DRAINAGE BASIN															
Northeast	296	4,603,280	9	949,755	242	6,267,795	96	129	30	146	310	9	49	36	137
North Atlantic	616	11,468,477	4	1,409,870	234	20,110,524	64	192	49	300	493	9	71	60	167
Southeast	444	4,864,276	9	149,175	374	5,132,353	173	362	36	432	791	2	18	125	328
Tennessee River	68	578,902	.....	.....	30	546,100	14	27	4	51	87	.....	6	16	18
Ohio River	393	6,608,390	28	1,818,345	299	7,400,560	47	276	38	269	576	37	76	63	136
Lake Erie	66	2,267,410	21	1,436,250	79	3,198,535	4	33	12	43	103	7	17	6	12
Upper Mississippi	353	2,728,542	4	4,119,070	288	9,705,623	72	399	104	548	1002	83	44	102	298
Western Great Lakes	262	7,019,453	6	301,100	159	7,910,340	32	52	56	203	292	11	37	42	64
Missouri River	39	992,910	4	36,850	112	2,008,310	90	366	61	180	545	21	20	63	556
Southwest-Lower Mississippi	143	1,974,840	1	3,000	180	3,019,897	69	396	69	285	693	29	14	10	283
Colorado River	18	640,500	.....	.....	30	818,460	28	24	13	28	66	2	.....	4	76
Western Gulf	246	2,526,245	1	25,000	257	5,168,701	27	455	49	235	645	49	6	6	80
Pacific Northwest	285	1,515,140	.....	.....	141	1,696,715	65	53	51	179	226	1	12	36	147
California	166	6,463,945	15	681,585	67	6,068,010	47	86	35	142	278	16	11	48	138
Great Basin	42	557,642	1	40,000	37	462,155	27	17	17	34	64	3	1	8	50
Alaska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....
Hawaii	12	51,376	.....	.....	1	6,750	1	.....	.....	.....	.....	.....	.....	1	2
Puerto Rico	1	58,660	.....	.....	15	67,940	20	18	5	.....	36	1	.....	5	22
Total	3,450	54,919,988	113	10,973,000	2,545	79,588,768	882	2,857	630	3,077	6,213	280	383	622	2,522

II. DATA ANALYSIS

General

As of January 1, 1962, there were 11,420 sewered communities in the United States whose sewer systems served over 118 million people. Based upon the census population of 123.5 million in these communities, 96 percent of the population living in these communities was connected to such systems. Based upon the January 1, 1962, national census estimates, 63 percent of the total U.S. population was connected to municipal sewers. This represents an increase of 6 percentage points over 1957. Of these 11,420 communities, 80.3 percent discharged treated sewage, 18.7 percent discharged untreated sewage, and 1.0 percent discharged both treated and untreated sewage. Some type of treatment was provided to 87.6 percent of the population which represents almost a 10-percentage-point increase since the last inventory.

There was a total of 9,378 treatment plants, of which 6,584 or 70.2 percent, were secondary, and served 59.0 percent of the population receiving treatment. Table 21 shows that the number of secondary plants increased 41.7 percent and the total population served by this type of treatment increased 41.2 percent since 1957.

States

Table 10 gives by States for the years 1945, 1957, and 1962, the percent of sewered-community census population which is connected to sewers, and the percentages of connected population from which sewage is discharged treated or raw. In some instances the percentage sewered is over 100 percent. This is due to the growth in the city since the 1960 census, plus the fact that some population living outside the census limits is also served. As is evident by the table, the State percentages vary greatly, ranging from 60.5 percent in New Hampshire to 153.8 percent in the State of Delaware. In 1945 there were 21 States having less than 50 percent of the sewered population connected to treatment facilities, while in 1962 this has been reduced to 7 States, excluding Hawaii and Alaska, which were not counted in the 1945 inventory.

In 23 States the population served by treatment exceeded 90 percent,

Table 10. *Percent of census population in sewered communities connected to sewers and raw and treated discharges—by States*

State	Population connected in sewered communities, percent of census population	Percent of connected population sewage discharged					
		Raw			Treated		
		1945	1957	1962	1945	1957	1962
Alabama	85.3	52.0	47.9	17.6	48.0	52.1	82.4
Alaska	69.9	(2)	(2)	83.8	(2)	(2)	16.2
Arizona	73.2	9.1	4.4	3.7	90.9	95.6	96.3
Arkansas	93.2	47.3	40.6	22.0	52.7	59.4	78.0
California	84.0	26.5	2.3	.5	73.5	97.7	99.5
Colorado	112.1	14.4	5.9	1.6	85.6	94.1	98.4
Connecticut	73.1	23.9	7.8	3.5	76.1	92.2	96.5
Delaware	153.8	81.4	8.0	1.6	18.6	92.0	98.4
District of Columbia	(1)						
Florida	80.4	53.5	25.9	2.9	46.5	74.1	97.1
Georgia	105.3	40.3	39.5	24.1	59.7	60.5	75.9
Hawaii	83.5	(2)	(2)	83.4	(2)	(2)	16.6
Idaho	92.1	76.2	53.2	13.8	23.8	46.8	86.2
Illinois	100.3	6.7	5.0	3.0	93.3	95.0	97.0
Indiana	100.8	29.3	16.4	9.4	70.7	83.6	90.6
Iowa	90.3	31.2	28.3	17.4	68.8	71.7	82.6
Kansas	102.1	30.0	20.3	10.6	70.0	79.7	89.4
Kentucky	101.7	73.1	12.6	8.2	26.9	87.4	91.8
Louisiana	117.8	79.5	73.0	60.6	20.5	27.0	39.4
Maine	74.6	97.7	89.1	90.8	2.3	10.9	9.2
Maryland	180.5	8.3	4.0	2.6	91.7	96.0	97.4
Massachusetts	97.4	38.3	29.2	19.2	61.7	70.8	80.8
Michigan	111.5	18.7	14.3	1.0	81.3	85.7	99.0
Minnesota	90.5	12.9	7.7	3.1	87.1	92.3	96.9
Mississippi	87.8	74.8	67.3	54.6	25.2	32.7	45.4
Missouri	91.6	81.0	73.0	65.5	19.0	27.0	34.5
Montana	95.9	71.2	55.0	6.0	28.8	45.0	94.0
Nebraska	85.8	53.8	51.8	40.5	46.2	48.2	59.5
Nevada	147.0	4.0	5.1	2.1	96.0	94.9	97.9
New Hampshire	60.5	89.9	81.2	79.0	10.1	18.8	21.0
New Jersey	90.0	21.8	2.3	1.2	78.2	97.7	98.8
New Mexico	97.5	.5	.2	.2	99.5	99.8	99.8
New York	104.7	37.6	29.3	15.0	62.4	70.7	85.0
North Carolina	93.2	35.5	30.1	25.8	64.5	69.9	74.2
North Dakota	90.9	16.7	20.3	15.7	83.3	79.7	84.3
Ohio	101.1	33.0	17.8	5.3	67.0	82.2	94.7
Oklahoma	90.6	21.7	4.4	.6	78.3	95.6	99.4
Oregon	95.8	81.6	8.1	6.5	18.4	91.9	93.5
Pennsylvania	110.2	72.9	42.0	12.2	27.1	58.0	87.8
Rhode Island	86.3	18.1	.7	.7	81.9	99.3	99.3
South Carolina	99.3	41.9	41.2	33.5	58.1	58.8	66.5
South Dakota	100.4	18.1	15.3	12.2	81.9	84.7	87.8
Tennessee	92.5	82.4	54.2	39.2	17.6	45.8	60.8
Texas	88.9	8.0	2.0	.6	92.0	98.0	99.4
Utah	114.0	86.8	59.5	33.1	13.2	40.5	66.9
Vermont	92.5	94.8	78.1	59.8	5.2	21.9	40.2
Virginia	94.5	72.1	34.3	4.4	27.9	65.7	95.6
Washington	96.7	79.3	57.6	32.8	20.7	42.4	67.2
West Virginia	90.0	89.6	75.3	59.5	10.4	24.7	40.5
Wisconsin	97.8	8.7	3.9	.3	91.3	96.1	99.7
Wyoming	98.3	63.9	36.0	4.2	36.1	64.0	95.8
Puerto Rico	12.3	(2)	(2)	21.9	(2)	(2)	78.1
Virgin Islands	(1)	(2)	(2)	(2)	(2)	(2)	(2)
Total	95.9	37.3	22.3	12.4	62.7	77.7	87.6

[1] These percentages are not shown, since they are unrealistic due to the the effect of the Washington Suburban Sanitary Commission discharging to the District of Columbia plant.
[2] Percentage figures not available for these years.

representing an increase of almost 44 percent over 1957. In only 9 States, including Alaska and Hawaii counted for the first time, did more than 50 percent of the connected population discharge raw sewage, while the counts for 1957 and 1945 were 13 and 21 States, respectively.

Geographical Areas

Census Bureau geographical area grouping has been used in table 11 to analyze general sewage work data. The States included in each group are listed in the footnotes, and have been arranged so that data can be compared with those of other fields pertinent to special problems analyses. As might be expected, the Middle Atlantic States have the largest population connected to sewers, followed by the East North Central Area. Continuing progress in sewage plant construction is indicated by the fact that in three areas, South Atlantic, Mountain, and Pacific, more than 90 percent of the sewer-connected population is provided with treatment facilities. Only in the combined noncontiguous areas of Alaska, Hawaii, and Puerto Rico, does the percent of the connected population receiving treatment fall below 70 percent. This indicates still further progress, considering that in 1957 three of the then nine areas fell below 70 percent which at that time excluded Alaska, Hawaii, and Puerto Rico.

Drainage Basins

Table 12 summarizes percentage data for sewer systems and raw and treated discharge by major drainage basins. There has been no significant change in community-totals distribution among the basins since the last inventory. The Upper Mississippi Basin, with 14.8 percent, has the largest percentage of communities, with the Ohio River Basin second with 12.2 percent. The continental basin with the smallest percentage of communities is the Great Basin with 1.3 percent. The North Atlantic still contains the greatest sewer-connected population (21.2 percent of the U.S. total), while Alaska and Puerto Rico with 0.1 percent have the least population connected.

There are noticeable changes in the percent of connected population discharging treated and raw sewage as well as the percent of total communities discharging treated and raw sewage. In every basin the percentage of connected population discharging treated sewage has increased in the last 5 years. The greatest change occurred in the Ohio River Basin where there was an increase of 28.6 percentage points, although an increase of only 17.5 percentage points was noted in the number of communities discharging treated sewage. Within the past 5 years, the population served by treatment in the Ohio River Basin has

Table 11. *Population served by sewers and sewage treatment—by geographical areas*

Geographic area	1960 Census population of sewered communities	Estimated population connected to sewers	Percent of census population connected to sewers	Percent of national total population connected to sewers	Percent of connected population—sewage discharged	
					Treated	Raw
New England [1]	8,511,492	7,392,281	86.9	6.2	77.4	22.6
Middle Atlantic [2]	26,512,308	27,506,580	103.8	23.3	88.2	11.8
South Atlantic [3]	13,067,282	12,653,527	96.8	10.7	84.8	15.2
East North Central [4]	25,691,760	26,391,336	102.7	22.4	96.5	3.5
East South Central [5]	5,481,488	5,016,087	91.5	4.2	72.7	27.3
West North Central [6]	10,015,843	9,253,032	92.4	7.8	71.4	28.6
West South Central [7]	11,679,545	10,948,019	93.7	9.2	86.4	13.6
Mountain [8]	4,634,862	4,651,735	100.4	3.9	92.2	7.8
Pacific [9]	16,299,712	14,013,902	86.0	11.8	95.3	4.7
Alaska, Hawaii, and Puerto Rico [10]	1,512,166	545,420	36.1	.5	30.3	69.7
Total	123,406,458	118,371,919	95.9	100.0	87.6	12.4

[1] Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut.
[2] New York, New Jersey, Pennsylvania.
[3] Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida.
[4] Ohio, Indiana, Illinois, Michigan, Wisconsin.
[5] Kentucky, Tennessee, Alabama, Mississippi.
[6] Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas.
[7] Arkansas, Louisiana, Oklahoma, Texas.
[8] Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada.
[9] Washington, Oregon, California.
[10] Alaska, Hawaii, Puerto Rico.

Table 12. *Percentage data for sewer systems and raw and treated discharge—by drainage basins*

Major drainage basins	Percent of U.S. total communities	Percent of census population connected to sewers	Percent of national total population connected to sewers	Percent of connected population—sewage discharged		Percent of total communities discharging		
				Raw	Treated	Raw	Treated	Both raw and treated
Northeast	7.3	91.2	9.3	20.9	79.1	43.3	54.5	2.2
North Atlantic	10.0	104.5	21.2	8.8	91.2	18.2	81.4	.4
Southeast	10.3	91.2	7.6	20.3	79.7	20.7	75.3	4.0
Tennessee River	1.5	89.6	.9	19.2	80.8	37.1	61.1	1.8
Ohio River	12.2	101.4	9.6	13.1	86.9	35.1	64.3	.6
Lake Erie	1.8	100.5	2.9	3.1	96.9	23.1	76.0	.9
Upper Mississippi	14.8	96.5	11.0	11.6	88.4	12.3	87.7	.....
Western Great Lakes	4.4	107.1	7.5	1.0	99.0	7.6	92.0	.4
Missouri River	11.2	94.4	4.2	27.4	72.6	14.1	85.4	.5
Southwest-Lower Mississippi	9.0	101.7	6.0	30.5	69.5	10.7	88.6	.7
Colorado River	1.4	87.8	.9	5.4	94.6	19.3	80.7	.....
Western Gulf	5.5	88.9	5.6	.6	99.4	1.6	98.4	.....
Pacific Northwest	4.0	95.3	2.5	22.6	77.4	18.1	80.8	1.1
California	4.3	83.7	9.5	.3	99.7	2.2	97.4	.4
Great Basin	1.3	111.8	.8	24.4	75.6	11.5	87.2	1.3
Alaska	.2	69.9	.1	83.8	16.2	95.2	4.8	.....
Hawaii	.2	83.5	.3	83.4	16.6	42.1	47.4	10.5
Puerto Rico	.6	12.3	.1	21.9	78.1	14.3	85.7	.....
Total	100.0	95.9	100.0	12.4	87.6	18.7	80.3	1.0

climbed from 19.3 points below the national average to within one point of the national average of 87.6 percent.

The California Basin, with only 4.3 percent of the total sewered communities in the United States, has the highest (99.7) percentage of connected population discharging treated sewage, while 97.4 percent of its communities provide treatment. On the low side of the picture (excepting Alaska and Hawaii), the Southwest Lower Mississippi River Basin has 69.5 percent of the connected population receiving treatment from the 88.6 percent of its communities which have disposal facilities.

Population

Table 13 data show the percentage distribution among the various groups for sewered communities, census population of these communities, connected population, populations discharging raw and treated sewage, and number of treatment plants. In general this table reflects no major changes since the 1957 inventory. Disposal facilities of communities in the 100,000-and-over population group serve 55.7 percent of the total U.S. sewered population, an increase of only 2.5 percentage points in the last 5 years. While the same group accounts for only slightly over 1.0 percent of the sewered communities in the United States, the same as in 1957, the relative percentage of all treatment plants has almost doubled from 2.2 percent to 4.2 percent. Although communities in the 1,000–5,000 population group decreased in number since 1957, this group contained the largest percentage of sewered communities and treatment plants while serving only 8.3 percent of the total population.

Table 14 gives for each size group the percent of census population connected to sewers, together with the percent of the sewered population discharging raw and treated sewage for the years of 1945, 1957, and 1962. In 1962 for the first four groups the percentage of census population in sewered communities connected to sewers declined with the increase in population, then increased throughout the remaining four population groups. In 1945 three of the groups exceeded the national percentage of treated discharge; in 1957 only one group, that of 100,000 population and over; and in 1962 two groups bettered the national average. In 1957 only one group, that of 100,000 population and over, exceeded 80 percent of the connected population discharging treated sewage, whereas in 1962 six of the eight population groups exceeded 80 percent. The largest increase (15.3 percentage points) occurred in the 25,000–50,000 population size group.

Comparison With Prior Data

Selective summary data of importance are given in table 15, making it possible to compare earlier statistical summaries dating from 1940. In

Table 13. *Percentage data for sewer systems and raw and treated discharge—by population groups*

Population size groups	Percent of total number of sewered communities	Percent of 1960 census population of sewered communities	Percent of total population connected—				Percent of total number of treatment plants
			To sewer systems	To raw discharge or treatment facilities[1]	To raw sewage discharge facilities	To sewage treatment facilities	
Under 500	11.0	0.3	0.3	0.3	0.4	0.3	11.1
500–1,000	16.0	1.1	1.1	1.0	1.9	.9	15.0
1,000–5,000	43.9	9.5	9.0	8.3	13.5	7.6	41.9
5,000–10,000	12.3	8.0	7.2	6.5	8.8	6.1	11.9
10,000–25,000	10.1	14.4	13.7	11.0	11.9	10.8	10.2
25,000–50,000	3.8	11.8	11.5	8.6	7.5	8.8	3.9
50,000–100,000	1.7	11.2	11.4	8.6	10.6	8.3	1.8
Over 100,000	1.2	43.7	45.8	55.7	45.4	57.2	4.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Percent of total connected population discharging through sewer outfall facilities of the population group.

Table 14. *Percent of census population connected to sewers and population discharging raw or treated sewage within population groups*

Population size groups	Percent of census population in sewered communities connected to sewers			Percent of connected population in discharging					
				Raw			Treated		
	1945	1957	1962	1945	1957	1962	1945	1957	1962
Under 500	92.7	112.1	102.5	35.7	25.5	17.6	64.3	74.5	82.4
500–1,000	77.1	90.1	93.4	[1] 35.5	29.2	23.3	[1] 64.3	70.8	76.7
1,000–5,000	77.6	82.5	91.1	[2] 39.1	29.1	20.1	[2] 60.8	70.9	79.9
5,000–10,000	83.4	96.5	85.5	42.0	23.8	16.9	58.0	76.2	83.1
10,000–25,000	88.0	101.3	91.6	43.7	24.4	13.5	56.3	75.6	86.5
25,000–50,000	95.7	100.7	93.1	41.8	26.0	10.7	58.2	74.0	89.3
50,000–100,000	96.7	101.4	98.1	45.7	25.4	15.2	54.3	74.6	84.8
Over 100,000	95.3	96.9	100.6	33.0	19.1	10.1	67.0	80.9	89.8
Total	91.1	96.4	95.9	37.3	22.3	12.4	62.7	77.7	87.6

[1] 0.2 percent discharging through semipublic facilities not included.
[2] 0.1 percent discharging through semipublic facilities not included.

the past 22 years there has been an increase of 34 percent in the number of sewered communities serving an increase in population of nearly 68 percent. The percentage of the census population connected to sewers has increased 2.8 percentage points, indicating that as the population increased, a relative lesser proportion is being served by individual disposal systems. From 1940 to 1957 the population connected to raw sewage facilities declined 26.7 percent, while from 1957 to 1962 there was another decrease of 33.0 percent. For the 22-year period the net reduction in this category has been 50.9 percent in the face of a 68-percent increase in population served.

Table 15. *Comparative data for 1940–62 for sewage disposal systems*

	1940	1945	1948	1949	1957	1962
Number of sewered communities	8,516	8,917	(*)	(*)	11,131	11,420
Census population	[1] 75,728,000	[1] 82,012,692	(*)	(*)	[2] 102,047,712	[2] 123,406,458
Estimated population connected	70,506,000	[7] 74,740,887	76,680,685	78,850,870	98,361,396	118,371,919
Percent of census population connected	93.1	91.1	.....	.....	96.4	95.9
Raw discharge:						
Number of communities	[3] 3,597	[4] 3,610	[5] 3,800	[5] 3,718	[6] 3,165	[9] 2,249
Estimated population served	29,889,000	27,867,783	27,982,490	28,067,350	21,917,665	14,686,941
Percent of total sewered population	42.4	37.3	36.5	35.6	22.3	12.4
Treated discharge:						
Number of communities	[3] 5,085	[4] 5,480	(*)	(*)	[6] 8,066	[9] 9,281
Estimated population served	40,617,000	46,865,114	48,698,195	50,783,520	76,443,731	103,684,978
Percent of total sewered population	57.6	62.7	63.5	64.4	77.7	87.6

*Data are not available.

[1] 1940 census data.
[2] 1950 census data.
[3] Includes 166 communities discharging both raw and treated sewage.
[4] Includes 173 communities discharging both raw and treated sewage.
[5] Includes communities where only part of sewage is discharged untreated.
[6] Includes 100 communities discharging both raw and treated sewage.
[7] Includes 7,990 population discharging through semipublic facilities and not included in discharge data.
[8] 1960 census data.
[9] Includes 110 communities discharging both raw and treated sewage.

Table 16 presents data on sewage discharge to surface waters. Some care must be exercised in the use of these figures because of the way they were computed. Prior to 1957 there was no information on population equivalents of sewage at the plant or discharge point. In the 1957 inventory, estimates were given for facilities serving 56 percent of the sewered population. From these figures it was possible to derive an estimated percentage removal for each degree of treatment. While these figures applied strictly to the 1957 data, they were applied arbitrarily to the population served in 1940 and 1945. Since the 1957 percentage removal accounts for such industrial wastes as may be treated by municipal facilities, the application of this figure to earlier data may result in a misstatement to the extent of changes in the relative amounts of industrial loadings. In the 1962 inventory, this information on population equivalents was available for facilities serving 65 percent of the sewered population. The resulting reductions by degree of treatment are shown in table 16. A comparison of the population equivalent of raw discharge with the population served discharging raw will show an excess of some 27 percent. This was the overall relationship between population equivalent and population served and is presumed to reflect industrial wastes. In order to make earlier data more nearly comparable, the figures for raw discharge for 1940, 1945, and 1957 have been increased by 25 percent over

Table 16. *Sewage discharge to watercourses in 1940, 1945, 1957, and 1962*

Treatment	Derived percent reduction 1962	Estimated population discharged (1,000's)			
		1940	1945	1957	1962
None	0.0	[1] 37,372	[1] 34,835	[1] 27,398	18,698
Minor	21.9	3,288	4,270	1,860	2,352
Primary	32.6	10,396	11,798	17,633	22,994
Intermediate	51.3	2,201	2,051	3,047	4,953
Secondary	82.1	3,178	3,790	7,582	15,206
Total		56,435	56,744	57,520	64,203

[1] Revised from earlier publications. Increased by 25 percent. See text page 26.

earlier published data. Between 1940 and 1957 there was very little change in the population equivalent loading to streams—from 56.5 to 57.5 million. In 1962, however, this had increased by 11.6 percent to 64.2 million in spite of an impressive decrease in raw discharge.

Development of Community Sewer Systems

Table 17 shows the chronology of the development of sewer systems in the United States from 1860 through 1962, listing the national population for the year, the number of sewered communities, and the population served by sewers. While the number of sewered communities has increased by 28 percent since 1945, the largest increase came from 1945 to 1957, almost 25 percent. Since 1957 the number of sewered communities

Table 17. *Development of sewer systems in the United States*

Year	Total U.S. population—millions	Sewage facility development	
		Number of sewered communities	Population served by sewers (millions)
1860 [1]	31.4	10	1.0
1870	38.6	100	4.5
1880	50.2	400	9.5
1890	62.9	450	16.1
1900	76.0	950	24.5
1910	92.0	1,600	34.5
1920	105.7	3,000	47.5
1930	122.8	5,100	61.5
1935	132.0	6,800	69.5
1940 [2]	132.7	8,516	70.5
1945 [3]	139.6	8,917	74.7
1948 [4]	[5] 144.6	(6)	76.7
1949 [4]	[5] 149.2	(6)	78.9
1957	[5] 171.2	11,131	98.4
1962	[5] 185.8	11,420	118.4

[1] Data for 1860 to 1935, inclusive from Hyde, C. G.: Modern Sewage Disposal. Federation of Sewage Disposal Works Associations, 1938, pp. 1–14.
[2] Data for 1940 from (2). "Number of communities corrected from 8,518."
[3] Data for 1945 from (3).
[4] Data for 1948 and 1949 from unpublished U.S. Public Health Service data.
[5] July 1, 1962 data, estimated by Census Bureau, Current Population Reports, Series P–25.
[6] Not available.

has increased only 2.6 percentage points. On a population-served basis, there has been an increase of 58.5 percent from 1945 to 1962. About half of this increase occurred between 1957 and 1962. This suggests that emphasis is being placed on extensions of sewers to the outlying urban areas and consolidating adjacent existing sewered communities with the parent community.

The percent of total sewered communities and connected population by population groups is presented in table 18 for the years 1945, 1957, and 1962. Nearly 71 percent of the sewered communities had census populations of less than 5,000, but only 10 percent of the population connected to sewers lived in these places. These percentages have been gradually dropping since 1945, reflecting the increase in urban areas. Cities of over 100,000 make up only 1.2 percent of the total number, but hold 45.8 percent of the population connected.

Table 18. *Percent of total sewered communities and connected population by population groups*

Population size groups	Communities sewered (accumulated percent of total)			Estimated connected population (accumulated percent of total)		
	1945	1957	1962	1945	1957	1962
Under 500	8.8	11.3	11.0	0.3	0.4	0.3
500–1,000	27.6	28.9	27.0	1.6	1.7	1.4
1,000–5,000	76.3	75.7	70.9	11.9	12.6	10.4
5,000–10,000	87.6	87.1	83.2	19.7	21.2	17.6
10,000–25,000	95.3	95.1	93.4	31.9	35.1	31.3
25,000–50,000	97.7	97.8	97.0	41.6	45.6	42.8
50,000–100,000	98.9	99.0	98.8	51.2	55.3	54.2
Over 100,000	100.0	100.0	100.0	100.0	100.0	100.0

Sanitary Districts and Communities Serving Others

Table 19 was developed from data given in table 4 and delineates the percent of sewered population served by or serving others by population size groups. As reported by this inventory, over 26.8 million persons in the United States were served by the disposal facilities of other communities or sanitary districts. This represents an increase of 33.3 percent since 1957 and is more than double (120 percent increase) that of 1945. Also pertinent is the fact that almost 23 percent of the total sewered population in the country utilizes this method for waste disposal, compared with 16 percent in 1945 and 20 percent in 1957. Between 1945 and 1957 the percentage of sewered population served by other facilities increased in all population groups.

The 1962 data show that, in places between 5,000 and 100,000 population, even higher percentages of the sewered population dispose of their

Table 19. *Percent of sewered population served by or serving others by population groups*

	Year	Population size groups								U.S. total
		Less than 500	500–1,000	1,000–5,000	5,000–10,000	10,000–25,000	25,000–50,000	50,000–100,000	Over 100,000	
Percent of sewered population served by disposal facilities of others	1962	8.4	6.8	10.3	18.8	25.5	31.4	35.7	20.0	22.6
	1957	12.8	6.9	11.9	16.3	22.9	27.7	25.1	20.4	20.4
	1945	7.6	3.7	6.2	10.8	14.0	20.9	17.6	19.2	16.3
Percent of population served from other communities	1962	.9	2.8	2.6	9.9	6.7	8.8	15.0	34.1	22.6
	1957	.2	.6	1.9	2.8	5.1	7.6	15.2	33.0	20.4
	1945	2.5	.3	1.9	2.5	2.7	6.3	11.2	26.4	16.3

waste through other facilities, particularly in cities between 50,000 and 100,000 population where one in three is served by others. In the 8,100 places under 5,000 population, a lesser percentage of the sewered population was served by others. Compared with 1957, this would indicate that building of disposal facilities has progressed relatively more rapidly here than in larger places.

The 1957 summary (*6*) said, ". . . the situation still remains that most of the smaller communities are so situated that they cannot avail themselves of such favorable circumstances as connection to larger systems. Their problems are no less real, however, and invite concern of official agencies." The figures cited above seem to indicate this concern has resulted in some action. Not only is a slightly larger percentage of the population in these places being served by local facilities, these same facilities (though modest in number) have taken on the task of serving others. The most noticeable increase in such services is in the cities between 5,000 and 10,000. Although every fifth person is served by outside facilities, of those served by local facilities, 1 in 10 is in another community. This service to others is relatively three times higher than in 1957. As might be expected, the very large cities (over 100,000) serve many others—every third person is an "outsider."

Type of Sewers

Table 20 gives the percent of each type of sewer within the population groups. The national average shows that 82.5 percent of the reported communities has separate storm and sanitary sewers, 11.9 percent has combined sewers, and 5.6 percent has both separate and combined sewers. Comparison with the 1957 figure reveals that while the percent for separate sewers has remained practically unchanged, there has been a decrease in the relative number of communities utilizing combined sewers, and a balancing increase in those communities having both separate and

Table 20. *Percent of each type of sewer within population groups*

Population size group	Percent [1] of communities with—		
	Separate sewers	Combined sewers	Both separate and combined sewers
Under 500	94.5	4.4	1.2
500–1,000	88.6	9.6	1.8
1,000–5,000	83.3	12.2	4.5
5,000–10,000	77.8	12.7	9.5
10,000–25,000	76.2	15.1	8.7
25,000–50,000	66.6	17.8	15.6
50,000–100,000	61.4	24.7	13.9
Over 100,000	51.1	21.8	27.1
Total	82.5	11.9	5.6

[1] Percent of reported cases.

combined sewers. The conclusion is that there is a slow but definite trend toward the use of separate sewers. The use of separate sewers in communities varies directly with the population increase. In communities of 500 population and under, 94.5 percent has separate sewers, and as the population increases, the percentage falls rapidly to the largest population group where only 51.1 percent of the communities is served by separate sewers. On a population basis, 48.4 percent of the connected population is served by separate sewers.

More efficient reporting of data in this category is evident by the fact that in 1957 there were 620 communities which did not state the type of sewers used, where in 1962 only 414 communities failed to report this item.

Treatment

Table 21 shows a comparison in the number of plants and estimated population served for the years 1940, 1945, 1948, 1957, and 1962 along with the percentage of change increase or decrease for the 1962 inventory as compared with 1945, 1949, and 1957. The plants category data have shown a noticeable decrease in minor, primary, and intermediate treatment plants since 1940. Correspondingly, there has been an increase in the number of secondary plants—nearly 136 percent since 1945.

The percentage distribution within population groups and drainage basins for the number of plants and population served in 1962 for the various degrees of treatment is shown in tables 22 and 23, respectively. Since 1957 primary treatment has dropped noticeably both as to percentage of all plants and population served. This is true for all population size groups except the 50,000–100,000 group. Nationally the proportion of primary treatment plants dropped 7.8 percentage points

Table 21. *Sewage treatment data—1940 to 1962*

NUMBER OF PLANTS

Degree of treatment	1940	1945	1948	1949	1957	1962	Percent change[3]		
							1945–62	1949–62	1957–62
Minor	49	60	51	54	41	37	(38.3)	(31.5)	(9.8)
Primary	2,889	2,829	2,984	3,019	2,730	2,672	(5.5)	(11.5)	(2.1)
Intermediate	2,630	98	106	107	100	85	(13.3)	(20.6)	(15.0)
Secondary		2,799	2,917	3,050	4,647	6,584	135.2	115.9	41.7
Total	[1] 5,580	5,786	6,058	6,230	7,518	9,378	62.1	50.5	24.7

ESTIMATED POPULATION SERVED—1,000's

Minor	3,288	4,270	4,019	3,851	1,860	2,351	(44.9)	(38.9)	26.4
Primary	15,133	17,173	18,393	17,218	25,667	32,734	90.6	90.1	27.5
Intermediate	22,171	3,763	3,595	3,625	5,591	7,409	96.9	104.4	32.5
Secondary		21,659	22,691	26,090	43,326	61,191	182.5	134.5	41.2
Total	[2] 40,617	46,865	48,698	50,784	76,444	103,685	121.2	104.2	35.6

[1] Includes 12 plants—unknown treatment.
[2] Includes 25,000—unknown treatment.
[3] ( ) denotes decrease.

during the last 5 years and the estimated population so served dropped 2.0 percentage points.

Similarly, there was a marked increase in the number of secondary plants throughout the population groups. However, there was only a slight net increase in the relative percentage of the estimated population served by secondary treatment. The actual number of population served increased more than 40 percent over 1957.

Minor and intermediate treatment plants together served less than 10.0 percent of the estimated population receiving treatment.

Table 23 depicts significant differences in practice among the drainage basins. In the Western Gulf 97.5 percent of the population connected to treatment is served by secondary plants, while only 21.0 percent is so served in the Northeast Basin. Of the continental basins, the California Basin has the highest percentage of population served by primary treatment, closely followed by the Pacific Northwest, while the Missouri River Basin reports the greatest percentage served by intermediate treatment bearing in mind there are only 85 such plants serving 7.4 million persons.

Primary Treatment

In table 2 is shown the number of plants and estimated population served for the various types of processes, together with relative percentages. In 1962 there was a total of 2,672 primary plants serving over 32 million persons. As in 1957, the most used type of primary plant was the Imhoff tank, although the population served by this type of plant decreased 25

Table 22. *Number of plants and population served by degree of treatment—percent of total within each population size group*

Population size groups	Total		Minor		Primary		Intermediate		Secondary	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Under 500	100.0	100.0	0.1	0.1	28.3	28.1	.....	.....	71.6	71.8
500–1,000	100.0	100.0	.4	.4	30.6	30.2	.....	.....	69.0	69.4
1,000–5,000	100.0	100.0	.3	.4	31.0	27.7	0.4	0.5	68.3	71.4
5,000–10,000	100.0	100.0	.3	.2	23.8	22.1	1.1	1.2	74.8	76.5
10,000–25,000	100.0	100.0	.7	1.4	22.4	25.4	2.5	3.0	74.4	70.2
25,000–50,000	100.0	100.0	.3	.4	30.6	33.9	2.7	4.5	66.4	61.2
50,000–100,000	100.0	100.0	.6	1.1	26.7	27.2	5.3	6.9	67.4	64.8
Over 100,000	100.0	100.0	2.0	3.4	23.5	34.6	3.5	10.0	71.0	52.0
Total	100.0	100.0	0.4	2.3	28.5	31.6	0.9	7.1	70.2	59.0

Table 23. *Number of plants and population served by degree of treatment—percent of total within each major drainage basin*

Major drainage basin	Total		Minor		Primary		Intermediate		Secondary	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Northeast	100.0	100.0	2.8	21.5	58.0	55.5	1.2	2.0	38.0	21.0
North Atlantic	100.0	100.0	1.1	1.6	34.3	22.7	1.6	12.5	63.0	63.2
Southeast	100.0	100.0	.7	1.1	43.4	30.5	.3	8.8	55.6	59.6
Tennessee River	100.0	100.0	.....	.....	48.6	48.8	.....	.....	51.4	51.2
Ohio River	100.0	100.0	.1	.1	32.1	22.8	3.3	12.3	64.5	64.8
Lake Erie	100.0	100.0	.....	.....	24.2	17.3	6.3	5.2	69.5	77.5
Upper Mississippi	100.0	100.0	.1	<.1	17.4	9.2	.4	9.7	82.1	81.1
Western Great Lakes	100.0	100.0	.5	.1	41.5	60.9	2.3	3.2	55.7	35.8
Missouri River	100.0	100.0	.....	.....	17.5	16.5	.4	15.9	82.1	67.6
Southwest-Lower Mississippi	100.0	100.0	.....	.....	19.9	14.0	.1	<.1	80.0	86.0
Colorado River	100.0	100.0	.....	.....	28.7	5.7	.....	.....	71.3	94.3
Western Gulf	100.0	100.0	.....	.....	11.1	2.5	.....	.....	88.9	97.5
Pacific Northwest	100.0	100.0	.5	.3	43.3	65.7	.5	.5	55.7	33.5
California	100.0	100.0	.2	<.1	21.6	69.0	.9	3.4	77.3	27.6
Great Basin	100.0	100.0	.....	.....	21.2	5.3	.8	.6	78.0	94.1
Alaska	100.0	100.0	.....	.....	100.0	100.0	.....	.....	.....	.....
Hawaii	100.0	100.0	.....	.....	47.0	43.8	.....	.....	53.0	56.2
Puerto Rico	100.0	100.0	.....	.....	57.6	78.9	1.7	.2	40.7	20.9
Total	100.0	100.0	.4	2.3	28.5	31.6	.9	7.1	70.2	59.0

percent in the 5 years. The use of septic tanks by communities also declined during the past 5 years. In 1957, septic tanks comprised 28.6 percent of the total primary treatment plants serving 3.8 percent of the population served by primary plants, whereas in 1962, septic tanks comprised 21.5 percent of the total primary plants and served only 2.1 percent of the population connected to primary treatment.

The use of mechanically cleaned tanks has continued to increase since 1957. From 1945 to 1957 they increased over 84 percent in number and 95.1 percent in population served. From 1957 to 1962 they increased 26.8 percent in number and 48.6 percent in population served. Mechanically cleaned tanks served 84.6 percent of the total population receiving primary treatment as compared to 72.7 percent of the population in 1957.

Table 24 shows the percent of plants of the various types as well as connected population within each population group. Table 25 reports the same data by drainage basin. As would be expected, septic tanks and Imhoff tanks predominate in the smaller population groups with mechanically cleaned tanks taking their place in communities of over 5,000 population. As in the 1957 inventory, considerable variations of practice exists among the basins. Septic tanks serve 48.0 percent of the population connected to primary treatment in the Great Basin while in the Lake Erie Basin, 9.7 percent of the population is connected to septic tanks. In the California Basin over 99.5 percent of the population served by primary treatment is connected to plants with mechanically cleaned tanks, while the corresponding figure is only 7.2 percent in the Western Gulf Basin.

Intermediate and Secondary Treatment

There are 6,669 intermediate and 6,584 secondary treatment plants in the United States serving 7.4 and 61.2 million persons, respectively. Intermediate treatment, which is defined as a chemical treatment of sewage with sedimentation in the absence of any secondary processes, is utilized by 85 plants. The use of intermediate treatment plants declined 15.0 percent since 1957, although population served by this type of treatment increased 32.5 percent during the same period.

In the secondary category, activated sludge plants have increased since 1957 in number by 35.8 percent and serve 54.3 percent of the total connected population. Trickling filter plants, both standard and high rate, total 3,506 and serve over 23 million persons, or 37.7 percent of the population. This represents increases of 30.7 percent in the number of plants and 50.2 percent in population served since 1957.

With reference to table 26 (secondary treatment, percent of types of plants, and population served within population groups), the relative use of activated sludge plants increase as size of the community increases.

Table 24. *Primary treatment—percent of types of plants and population served within population groups*

Population size groups	Total		Septic tanks		Imhoff tanks		Mechanically cleaned tanks		Plain hopper bottom tanks		Tank—no detail		Others and unknown	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Under 500	100.0	100.0	40.2	34.7	49.2	52.1	6.8	9.3	2.4	2.8	1.4	1.1	.....	.....
500–1,000	100.0	100.0	30.2	27.1	49.6	50.1	14.2	15.5	4.2	4.5	1.2	2.1	0.6	0.7
1,000–5,000	100.0	100.0	22.0	14.8	44.9	39.4	29.2	41.5	2.1	2.1	1.2	1.6	.6	.6
5,000–10,000	100.0	100.0	11.3	5.0	20.0	15.1	63.8	73.4	2.6	3.4	1.9	2.7	.4	.4
10,000–25,000	100.0	100.0	6.0	2.3	12.1	9.0	74.4	83.0	3.7	2.6	2.4	1.9	1.4	1.2
25,000–50,000	100.0	100.0	6.3	3.3	9.9	5.5	78.4	84.5	.9	.8	3.6	4.8	.9	1.1
50,000–100,000	100.0	100.0	13.0	.5	8.7	8.4	73.9	88.5	2.2	2.6	2.2	<.1	.....	.....
Over 100,000	100.0	100.0	2.1	<.1	17.3	3.0	76.3	91.1	4.3	5.9	.....	.....	.....	.....
Total	100.0	100.0	21.5	2.1	38.0	7.6	35.7	84.6	2.7	4.5	1.5	.9	.6	.3

Table 25. *Primary treatment—percent of types of plants and population served within drainage basins*

Major drainage basin	Total		Septic tanks		Imhoff tanks		Mechanically cleaned tanks		Plain hopper bottom tanks		Tank—no detail		Others and unknown	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Northeast	100.0	100.0	19.7	1.7	26.2	12.8	44.9	82.9	6.8	2.1	1.7	0.3	0.7	0.2
North Atlantic	100.0	100.0	16.1	2.7	31.9	4.9	38.6	62.5	4.7	25.3	8.3	4.6	.4	<.1
Southeast	100.0	100.0	27.7	5.4	46.6	11.1	23.7	82.7	1.2	.2	.4	<.1	.4	.6
Tennessee River	100.0	100.0	20.4	3.7	35.2	9.2	37.0	85.1	1.9	.4	5.5	1.6	.....	.....
Ohio River	100.0	100.0	11.6	1.7	44.6	19.5	40.3	77.6	1.9	.9	1.2	.2	.4	.1
Lake Erie	100.0	100.0	9.7	.1	58.1	56.7	32.2	43.2	.....	.....	.....	.....	.....	.....
Upper Mississippi	100.0	100.0	12.3	2.3	38.3	8.5	46.1	88.5	2.9	.6	.....	.....	.4	.1
Western Great Lakes	100.0	100.0	12.0	.4	18.1	1.2	67.5	98.1	.6	<.1	1.8	.3	.....	.....
Missouri River	100.0	100.0	24.3	9.4	53.5	13.1	20.8	76.8	1.0	.6	.....	.....	.4	.1
Southwest-Lower Mississippi	100.0	100.0	27.4	10.6	46.8	16.4	18.4	70.2	6.5	2.3	.9	.5	.....	.....
Colorado River	100.0	100.0	43.9	20.1	24.4	29.7	24.4	48.8	4.9	1.1	.....	.....	2.4	.3
Western Gulf	100.0	100.0	17.4	8.8	80.2	84.0	2.4	7.2	.....	.....	.....	.....	.....	.....
Pacific Northwest	100.0	100.0	26.1	1.8	19.3	2.2	51.2	92.4	1.7	.2	.....	.....	1.7	3.4
California	100.0	100.0	20.8	.2	15.6	.3	61.5	99.5	.....	.....	.....	.....	2.1	<.1
Great Basin	100.0	100.0	48.0	22.0	28.0	38.6	24.0	39.4	.....	.....	.....	.....	.....	.....
Alaska	100.0	100.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100.0	100.0
Hawaii	100.0	100.0	100.0	100.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Puerto Rico	100.0	100.0	58.8	14.1	32.4	6.7	8.8	79.2	.....	.....	.....	.....	.....	.....
Total	100.0	100.0	21.5	2.1	38.0	7.6	35.7	84.6	2.7	4.5	1.5	.9	.6	.3

Table 26. *Secondary treatment—percent of types of plants and population served within population groups*

Population size groups	Total		Activated sludge		Extended aeration		Trickling filter standard rate		Trickling filter high rate		Intermittent sand filter		Application to land		Stabilization ponds		Others and unknown	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Under 500	100.0	100.0	6.2	7.1	5.0	3.9	16.6	18.4	8.4	10.1	10.7	8.6	6.8	6.6	44.8	43.7	1.5	1.6
500–1,000	100.0	100.0	6.4	6.9	1.4	1.1	35.8	37.6	12.7	12.8	8.8	7.7	4.5	4.6	28.7	27.6	1.7	1.7
1,000–5,000	100.0	100.0	8.8	10.1	1.7	1.5	36.6	37.9	20.5	23.4	3.9	2.5	4.4	4.4	22.1	17.9	2.0	2.3
5,000–10,000	100.0	100.0	13.3	16.2	1.6	1.2	37.1	37.4	28.3	29.9	4.8	1.6	3.6	3.4	7.9	6.8	3.4	3.5
10,000–25,000	100.0	100.0	17.3	21.6	1.8	.7	33.1	32.8	32.3	33.7	2.8	1.7	2.1	1.8	6.9	4.2	3.7	3.5
25,000–50,000	100.0	100.0	28.2	34.3	3.7	1.7	22.0	20.8	32.0	34.7	1.7	.7	2.1	1.5	5.0	2.2	5.3	4.1
50,000–100,000	100.0	100.0	38.8	40.1	.9	1.1	25.9	26.0	22.4	27.2	.9	.8	3.4	2.8	7.7	2.0	.....	.....
Over 100,000	100.0	100.0	38.8	84.5	7.8	.1	18.9	6.8	23.8	8.1	1.4	<.1	.7	.2	2.2	<.1	6.4	1.3
Total	100.0	100.0	12.2	54.4	2.3	.7	32.4	18.8	20.8	18.8	5.1	.8	4.1	1.5	20.5	3.5	2.6	1.5

Trickling filter plants, both standard and high rate, on an overall average are extensively used in communities from 1,000 to 50,000 population, but use tapers off at both extremes of the population groups. Stabilization ponds are predominately used in the 500-and-under population size group, but their use in population groups through 5,000 has greatly increased. In fact, the use of stabilization ponds shows for the first time in the 50,000–100,000 population size group accounting for 7.7 percent of the secondary plants in this group.

On a drainage basin basis (table 27), wide variations of practice in secondary processes are evident. In the Lake Erie Basin, 51.7 percent of plants are of the activated sludge type, while in the Colorado River Basin only 2.0 percent are of this type. The Missouri River Basin reported the largest number of stabilization ponds (47.7 percent), while the Tennessee River Basin did not report any in operation. The Southwest-Lower Mississippi River Basin had the greatest number of standard rate trickling filters. These comprised 43.1 percent of the secondary plants in the basin.

Comparative data for intermediate and secondary processes are shown in table 28 for the years 1940 through 1962. Again, as in 1957, the largest increase over the past 5 years was in stabilization ponds. The number increased from 631 to 1,655, while the population served increased from 2.4 million to 4.3 million. The next largest increase occurred in the high rate trickling filter plants. Activated sludge plants increased from 603 plants to 774 and population served increased from 25.0 million to 31.1 million.

Sludge Digestion

Units for the digestion of sewage sludge were classified under four headings: septic tanks, Imhoff tanks, separate, and stage (table 9). Separate sludge digestion units increased 10.3 percent since 1957 to a total of 3,077 plants. Imhoff tanks increased slightly, to 2,857 plants. Stage digestion is in use at 630 plants in the United States, the majority being in the 1,000 to 25,000 population size group.

Sludge Dewatering

Sludge drying beds are reported in use at 6,213 plants, or 66.3 percent of all plants. Over 2,500 plants are listed as not having sludge dewatering or other organized method of drying in use. The great majority of these 2,500 plants are septic tanks or Imhoff tanks, where sludge is not drawn on any regular cycle. A total of 280 plants reports the use of sludge lagoons and 383 plants report mechanical dewatering of sludge.

Table 27. *Secondary treatment—percent of types of plants served within drainage basins*

Major drainage basins	Total		Activated sludge		Extended aeration		Trickling filter standard rate		Trickling filter high rate		Intermittent sand filter		Application to land		Stabilization ponds		Others an unknown	
	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served	Number of plants	Estimated population served
Northeast	100.0	100.0	12.4	29.8	3.2	4.0	34.7	36.2	11.4	19.6	31.1	7.1	1.0	<.1	2.6	1.1	3.6	2.2
North Atlantic	100.0	100.0	20.0	30.9	3.0	.4	33.2	6.8	17.6	7.4	9.4	1.1	1.1	.3	3.9	.4	11.8	2.7
Southeast	100.0	100.0	10.1	29.9	1.6	.2	23.5	24.1	44.8	40.4	7.3	.8	.6	.3	11.8	3.9	.3	.4
Tennessee River	100.0	100.0	15.8	27.1	.....	.....	56.1	57.2	22.7	14.3	1.8	.2	1.8	.1	.....	.....	1.8	1.1
Ohio River	100.0	100.0	25.5	65.4	8.3	1.7	37.5	21.3	18.9	9.9	4.8	.5	.6	<.1	2.9	.3	1.5	.9
Lake Erie	100.0	100.0	51.7	93.0	4.5	.1	29.2	4.3	9.0	2.3	4.5	.2	.....	.....	1.1	.1	.....	.....
Upper Mississippi	100.0	100.0	12.1	64.9	1.6	<.1	44.9	22.5	18.3	9.5	5.3	.4	.7	.1	16.7	2.4	.4	.2
Western Great Lakes	100.0	100.0	33.6	77.2	.9	.2	31.8	6.8	25.1	14.3	4.0	1.1	.5	<.1	1.8	.1	2.3	.3
Missouri River	100.0	100.0	5.9	16.3	1.2	2.2	31.5	35.8	5.5	20.5	5.2	1.3	1.9	.9	47.7	20.3	1.1	2.7
Southwest-Lower Mississippi	100.0	100.0	4.8	19.9	1.7	.6	43.9	39.9	15.9	30.7	2.1	.3	1.2	.3	29.8	7.5	.6	.8
Colorado River	100.0	100.0	2.0	42.8	1.0	<.1	6.9	6.2	23.5	35.8	2.9	1.7	22.5	5.3	40.2	8.2	1.0	<.1
Western Gulf	100.0	100.0	6.8	26.3	3.0	.6	21.7	19.0	27.6	42.0	2.6	.3	4.6	2.8	25.9	6.5	7.8	2.5
Pacific Northwest	100.0	100.0	8.8	16.8	.....	.....	15.6	16.3	42.0	47.7	1.3	.2	9.3	3.3	21.2	14.5	1.8	1.2
California	100.0	100.0	11.6	33.3	1.2	.4	19.8	20.4	18.3	23.5	.....	.....	32.5	15.0	15.4	6.7	1.2	.7
Great Basin	100.0	100.0	4.3	4.2	2.2	.2	10.9	30.2	20.7	36.3	.....	.....	30.4	10.1	22.8	7.9	8.7	11.1
Alaska	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.1	.9	.....	.....
Hawaii	100.0	100.0	11.1	25.7	44.5	33.7	.....	.....	33.3	39.7	.....	.....	.....	.....	.....	.....	.....	.....
Puerto Rico	100.0	100.0	29.2	16.7	.....	.....	.....	.....	70.8	83.3	.....	.....	.....	.....	.....	.....	.....	.....
Total	100.0	100.0	12.2	54.4	2.3	.7	32.4	18.8	20.8	18.8	5.1	.8	4.1	1.5	20.5	3.5	2.6	1.5

Table 28. *Intermediate and secondary treatment processes—comparative data for 1940, 1945, 1957, and 1962*

Type of treatment	Number of plants				Estimated population served (millions)			
	1940	1945	1957	1962	1940	1945	1957	1962
Chemical treatment	185	197	255	26	4.0	5.3	7.3	1.3
Activated sludge	302	324	603	774	10.5	11.6	25.0	31.1
Trickling filter standard rate	1,486	1,459	1,964	2,203	8.4	8.8	11.3	14.6
Trickling filter high rate		122	860	1,398		.7	6.5	12.3
Intermittent sand filter	432	448	398	351	.9	1.0	.9	.6
Application to land	304	422	461	401	.9	1.3	2.0	2.7
Stabilization ponds	(*)	45	631	1,655	(*)	.2	2.4	4.3
Extended aeration	(*)	(*)	(*)	156	(*)	(*)	(*)	.4

*Not available.

Chlorination

In 1962 there was a total of 3,450 treatment plants serving almost 55 million persons which had incorporated chlorination facilities (table 9). This unit process embraces 53.0 percent of the population served by treatment and is utilized by 36.8 percent of the treatment plants. This represents an increase of 45.2 percent of population served and an increase of 55.7 percent in the number of plants since 1957. Pennsylvania, with 329, has the largest number of such plants, while Alaska, Kansas, and North Dakota report no plants with chlorination facilities in use. Since 1957 there has been an increase in chlorination facilities throughout.

Grit Removal

Grit removal processes are employed at 2,545 plants serving over 79.5 million persons (table 9). This represents 27.1 percent of the total treatment plants and 76.8 percent of the population connected to treatment facilities. By comparison with 1957 figures, this means an increase of 61.0 percent in treatment plants employing grit removal and an increase of 53.9 percent in the population so served. As shown by table 29, population size groups, the use of grit removal processes increases as the community size (through 100,000 population) increases; it then drops in the over-100,000 population group. Comparative figures given in the table for 1957 and 1962 reveal a relative decrease in the use of grit removal processes by communities in population size group 25,000 through the over-100,000 group.

Grease Removal

Grease removal is reportedly used by 113 plants serving almost 11 million persons (table 9). Since 1957 there has been an 11.9-percent increase in the number of plants and a 64.3-percent increase in the popuation served.

Table 29. *Plants providing chlorination and grit removal by population groups*

Population size groups	Percent of plants providing—					
	Chlorination			Grit removal		
	1945	1957	1962	1945	1957	1962
Under 500	15.1	18.1	18.7	2.3	1.9	3.4
500–1,000	15.4	18.6	22.2	3.9	5.6	7.8
1,000–5,000	19.7	26.6	31.9	9.5	16.0	22.2
5,000–10,000	29.8	39.4	49.4	22.9	35.4	42.5
10,000–25,000	36.5	49.1	55.9	32.5	49.7	53.3
25,000–50,000	33.3	63.8	62.8	36.9	66.8	63.9
50,000–100,000	32.4	54.5	66.9	52.1	76.8	68.0
Over 100,000	37.7	54.9	66.4	52.5	72.0	50.0
Total	21.8	29.5	36.8	13.2	21.0	27.1

REFERENCES

(1) *Inventory of Municipal Waste Facilities by PHS Regions.* PHS Publication No. 1065, 9 vols., 1962.

(2) *A Summary of Census Data on Sewerage Systems in the United States.* Pub. Health Rep. 57: 409–421 (1942) Reprint No. 2363.

(3) Thoman, John R., *Statistical Summary of Sewage Works in the United States. Supplement 213*—Pub. Health Rep., 29 pp. (April 1950).

(4) Hyde, C. G., *A Review of Progress in Sewage Treatment During the Past Fifty Years in the United States. Chapter I, Modern Sewage Disposal,* Federation of Sewage Works Associations, 1938.

(5) *Inventory of Municipal and Industrial Wastes Facilities—by PHS Regions.* PHS Publication No. 622, 9 vols., 1958.

(6) *Statistical Summary of Sewage Works in the United States.* John R. Thoman and Kenneth H. Jenkins, PHS Pub. 609, 1958.

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